McCormick, Mickie Runnette

NEEDS ASSESSMENT OF MOTOR PROFICIENCY AND HEALTH-RELATED FITNESS FOR CHILDREN CONDUCTED IN COOPERATION WITH CLASSROOM TEACHERS IN GRADES K-3

The University of North Carolina at Greensboro ED.D. 1985

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NEEDS ASSESSMENT OF MOTOR PROFICIENCY AND HEALTH-RELATED FITNESS FOR CHILDREN CONDUCTED IN COOPERATION WITH CLASSROOM TEACHERS IN GRADES K-3

BY

MICKIE R. McCORMICK

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Approved By

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APPROVAL PAGE

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The purpose of this study was to use tests of motor proficiency and health-related fitness to assess selected motor needs of elementary school children and to establish a baseline for the development of physical education instructional objectives.

The study was conducted in the spring of 1984. One school from Robeson County, North Carolina, was selected for this study. The school had a student population of 323 and a teacher population of 13 and was classified as a K-3 elementary school. All of the teachers and students participated in the study.

The method of the study was a descriptive design. Quantitative data were collected, analyzed, and interpreted about student motor behavior. Only motor performance scores were used in the student assessment phases of the study. Qualitative data were collected, analyzed, and interpreted from teacher responses about the helpfulness and practicality of the needs assessment data.

Descriptive statistics were used to present and interpret the results of the school-wide overview of the motor performance data of the children. Nonparametric statistical analyses were used to describe the relative performance scores among groups of students on the Bruininks-Oseretsky Test of Motor Proficiency and the AAHPERD Health-Related Fitness Test. The Mann-Whitney

U-Test was used to determine whether the median scores of the males and females differed from each other to a significant degree on any test score or set of test scores; the Kruskal-Wallis One-Way ANOVA was used to determine whether any of the student groups differed from each other to a significant degree. Pearson Product Moment Correlations were computed to show to what extent test item scores were related.

Based on the data from the investigation, and within the limits of the study, the major finding was that the classroom teachers understood the "needs assessment" process and they agreed that the information obtained from the needs assessment could be useful and helpful to them in developing physical education objectives for their classes or for individual children.

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The collective influence of several people has helped to shape this research study, and lead to its completion.

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CHAPTER I

INTRODUCTION

> Each child is a unique individual with differing physical, mental, emotional, and social needs. Each child has the right to benefit from physical education experiences (AAHPERD, 1981).

The quotation is taken from a position statement about beliefs concerning children which was published by the American Alliance of Health, Physical Education and Recreation and Dance in 1981. For many years previous to that publication, physical educators have articulated these beliefs. However, the question remains: "Do elementary school physical education curriculum objectives reflect ideas about planning to serve individuals?"

In recent years, the way in which a student's learning has been evaluated has shifted from primary emphasis on the final product of student achievement to looking also at the progress that the child has made. But before an assessment can be made about what has been accomplished, the teacher must know the beginning status of the child's performance. Physical educators have begun to develop strategies to assess both process and product information about students in the belief that instructional objectives should reflect awareness of measured student status (McGee, 1984).

Other investigations in children's learning follow from the beliefs of individuals who have questioned the distribution of educational opportunities and the relevance of existing

programs (Lee, 1973). One result of this inquiry into a presumed inequality of educational opportunities was the development of the process of needs assessment.

Needs assessment, because it addresses the measurement of individuals in relation to reference groups, has become a part of some educational planning and development (Kaufman, 1983). Through the use of needs assessment the educator may identify and measure gaps between what might be expected from a child, or a group of children; determine the order of importance within these gaps, and decide which of the gaps to work on to obtain more congruence between curriculum objectives and curriculum outcomes (Scriven & Roth, 1978).

Such a process should yield information which can be used in educational planning, in curricular problem-solving, for making educational decisions, for accountability, and for supporting existing programs (Trimby, 1979). The information and data obtained, therefore, are used to design, implement, and evaluate instructional products or programs (Trimby, 1979). The process of needs assessment suggests an operational method for implementing curriculum objectives using the familiar Tyler Rationale (1950).

Tyler believed that when the needs of the learner are studied, certain data will be found to be common to most children of an age level whether they live in one part of the country or another, whether they are rural or city children, or whether they

are of one social class or another. If one accepts this working assumption, it would seem to follow that norms developed from an extensive testing program would be justified for use at the local level and in planning for individual needs.

Following further the logic of the Tyler Rationale, the possibilities of using status data as a basis for making some curriculum decisions within an elementary school physical education program should be explored. It was proposed that the investigator would introduce the concept of needs assessment in a local elementary physical education program by the use of tests of motor proficiency and health-related fitness from which physical education objectives could be derived by classroom teachers.

The strategies developed for this research project may prove to be an appropriate format for the development of specific curriculum objectives based on the needs of the students. Research findings about the efficacy of the needs assessment approach to the development of elementary school physical education curriculum objectives have not been found by a review of the published literature.

Purpose

The purpose of the study was to use tests of motor proficiency and health-related fitness to assess selected motor needs of elementary school children and to establish a baseline

for the development of physical education instructional objectives. Within that purpose, the principal research problem was addressed:

Do classroom teachers in a selected school view a motor proficiency and health-related fitness data base as being useful in developing physical education objectives?

The subproblems were expressed in the following questions:

1) What is the status of K-3 children on the motor proficiency and health-related fitness tests?

2) To what extent do classroom teachers report that the motor proficiency and the health-related fitness test data could be useful information for the development of K-3 physical education objectives?

3) How helpful and practical are the testing strategies developed for future use by the teachers at the selected school?

Definitions

Under the conditions of the investigation planned, the following definitions were accepted:

Needs Assessment

The process of identifying and documenting the gaps between what ought to be according to available norms and what now exists in the child's motor proficiency and health-related fitness status (Scriven & Roth, 1978).

Motor Proficiency

The ability of the child to perform effectively and efficiently gross and fine motor skills which have been identified through research as significant indicators of motor development in childhood and adolescence (Bruininks, 1972).

Health-Related Fitness

The fitness components which have a direct positive correlation to a person's health status (AAHPERD, 1980).

Assumptions

Under the conditions of the investigation planned, the following assumptions were accepted:

1) The Tyler Rationale provides a curriculum theory framework which includes the idea of a "needs assessment" as a concept that can be useful in curriculum development research.

2) The Bruininks-Oseretsky Test of Motor Proficiency and the AAHPERD Health-Related Fitness Test are appropriate tools to be used with children in grades K-3.

3) The test norms are accepted as valid for use with the children in the study.

Scope

The subjects tested for this study were the elementary school children from Green Grove Elementary School, Robeson County, North Carolina. Green Grove is a K-3 school. The total school population of 300 students were included in the study.

All of the classroom teachers from Green Grove participated in interview sessions to discuss the results of the two tests. Following the discussions the teachers were asked to respond to a questionnaire concerning their physical education goals and opinions of the tests.

The needs assessment took place during April 5th-20th, 1984. Trained testers and recorders assisted in the study.

The published test norms from the selected test batteries were used so that the motor proficiency and health-related fitness status of students could be identified and described in terms of other children of the same age, sex, and grade level.

The overall results of the two test batteries were presented to the classroom teachers and the principal at Green Grove Elementary School. After helping to test the children, the classroom teachers completed a questionnaire and participated in follow-up interview sessions concerning the helpfulness and practicality of motor proficiency and health-related fitness testing as a basis for developing their physical education objectives. No attempt was made to generalize the children's test scores beyond the Green Grove Elementary School.

The study was conducted under the following limitations on the testing program. All of the children were tested after 12:30 P. M. each day. The children wore their school clothes to take the tests. No special arrangements were made for the children to wear gym clothes. School policies required the

skinfold test to be administered over the children's clothing. The children were tested through thin shirts or dresses. Because skinfold measurements were taken over thin clothes, no conclusions can be drawn from this study regarding actual body composition of children. Since it is believed that the measurements are reliable, it appears reasonable that wide-range, mean differences between groups of children can be mentioned, especially concerning the forecast for future research and educational practice with these same children. The school did not have a track; therefore, a running course was prepared around the playground.

Significance

Tyler stated that the importance of studying the learner in research is to provide the curriculum developer with a basis for deriving objectives which should be given primary emphasis in the school's program (Tyler, 1950). The two parts of such a study would include: finding the present status of the students and comparing this status to acceptable norms in order to identify the gaps or needs which in turn would suggest educational objectives (Tyler, 1950).

All too often, teachers have developed curriculum objectives based on content areas without evaluating the present motor performance status of the students. Some reasons for this trend may be due to the fact that prior to 1965 there was a lack of information concerning motor performance of elementary school children, particularly before the age of 10 (Keogh, 1965, p. 1).

During the 1980s, however, the emphasis in motor development has been on investigating changes in motor performance over time. Using physiological variables, Halverson and Roberton (1984), Espenshade and Eckert (1980), and others reported how these variables influenced changes in selected motor performance tasks. But as late as 1982 Broadhead and Bruininks reported that there were few standardized batteries of tests with which to evaluate a sufficiently broad range of motor performance for any valid curriculum decisions to be made with any certainty (Broadhead & Bruininks, 1982).

The present study focuses on the needs assessment process, the present motor performance status of the students, as one source of providing information from which curriculum decisions can be made. The results should indicate to the individual classroom teachers the motor performance needs of the children, and therefore be helpful information for the teachers to use in deriving appropriate motor performance objectives for their classes and individual students.

The children involved in this study should become more aware of their motor performance characteristics. The teachers involved in this study should become more knowledgeable about their individual classroom children and all K-3 children at their school in the area of motor performance. Other school system personnel involved in this study should gain information from the data about the motor performance of the local children from one

specific school and how this knowledge base could serve as a rationale for the development of some physical education curriculum objectives.

The format of the research study may prove to be an appropriate framework for designing a curriculum based on the motor performance needs of the students. The results of using a "needs assessment" approach in the design of an elementary school physical education curriculum have not been reported previously in the literature. Robeson County has 16 elementary schools. Using this approach in the design of one of the county's elementary schools should serve as a model for the other 15 schools by relating how needs assessment research can be used to obtain information about children's motor performance and by illustrating how this information could be used in selecting appropriate physical education curriculum objectives.

CHAPTER II

REVIEW OF LITERATURE

A review of the literature related to this study indicated that much of the research conducted in physical education where children are concerned has concentrated on the motor functioning of the preschool child or children from pre-adolescence through young adulthood. The obvious variables of age, sex, weight, height, fitness, and personal-social measurements have been used to make comparisons. There is however, a distinct lack of information concerning motor proficiency and health-related fitness of K-3 elementary school children. A few studies dealt with determining factors which contribute to the motor performance of the child and discussed age trends, performance differences between the sexes, and methods of assessing motor performance. Examples of research in this category include the work of Espenshade (1960), Pissanos, Moore, & Reeve (1983), and Hyde (1975).

Relevant research for this study was focused primarily on the areas of needs assessment and motor performance of young children, ages five to eight, with emphasis on motor proficiency and health-related fitness. In the first segment the literature concerning the importance of needs assessment in planning physical education programs for children and the strategies for developing a needs assessment model is examined.

The second segment is presented which deals with motor performance studies relating to motor proficiency and health-related fitness factors of children five to eight years of age. The final segment reviews literature concerning measurement and evaluation techniques used in elementary school physical education as these apply to the research objectives of the study.

Needs Assessment

Change in education, as in society, is inevitable, especially in light of the pressures exerted by students, the communities, and the profession itself for quality education. One of the greatest challenges facing school leaders is whether or not they will be the masters of change or the victims of it (Melton, 1977).

Critical questions which can make the difference between useful and less-than-constructive change are a) change what?, b) change from what?, c) why change?, and d) if we change, what do we use to change? (Kaufman & English, 1979). Therefore, a foundation and a direction for change, based on identified and documented needs, must be established before strategies for problem resolution can be explored (Melton, 1977).

Many school systems around the country have recognized the requirement for controlled and purposeful change to stimulate renewed thrust toward educational excellence. To establish the necessary foundations for planning and to base decisions on documented evidence, they have utilized the concept of needs assessment as the first step in the process of change (Melton, 1977).

Needs assessments are recognized as tools for constructive and positive change (Kaufman & English, 1979). Needs assessment has become accepted as an integral part of educational planning and evaluation (Witkin, 1977). Through the use of a needs assessment process, many schools around the country have begun a systematic process which will culminate in the identification and specification of learner needs. It will set the standards by which curriculum can be developed, resources can be applied, and direct intervention can take place to fulfill identified learning outcomes (Melton, 1977).

Kaufman and English defined needs assessment as a formal process which determines the gaps between current outputs or outcomes and required or desired outcomes or outputs; places these gaps in priority order; and selects the most important for resolution. "Need" is defined as a gap between current outcomes or outputs and desired outcomes or outputs (Kaufman & English, 1979). Based on this definition, discrepancy needs assessment models were developed.

In one way or another, most of the discrepancy models of needs assessment draw on the pioneering work of Kaufman, who placed it in the context of systematic educational planning (Witkin, 1977). The discrepancy model is the most widely used model in elementary and secondary schools to assess learner needs (Witkin, 1977).

Needs assessment can be used as an ongoing part of the planning, implementation, and evaluation cycle. The data obtained from the assessment and evaluation become useful, integrated information to be used by the individual school or school district. Therefore, less risk in decision making is taken by the school administrators (Kaufman, 1983).

Kaufman (1983) developed a suggested taxonomy for needs assessment. The steps within the taxonomy are related to the steps within a systems approach to planning (Kaufman & English, 1979). One may start planning at any of the steps of a systems approach model; the only difference is the nature of data on hand from previous studies or the assumptions the planners are willing to make (Kaufman & English, 1979). The taxonomy of needs assessment which relates to this systems approach model:

- Alpha: Assumes few or no "givens" concerning starting conditions and ground rules for operation or resolution.
- Beta: Assumes the validity and utility of the goals and objectives of the sponsoring or target agency. Attends to finding the gaps between current organizational outputs and required or desired outputs only.
- Gamma: Starts by determining discrepancies concerning methods-means for problem resolution.
- Delta: Gap analysis relative to the existing objectives derived, not to any referent outside of the implementing agency.
- Zeta: A gap analysis for the entire process, based on the entire process as given and only discrepancies relative to the system are determined.

The two needs assessment models which seem to be more appropriate for educational settings are the Kaufman Model and the Lee Model (Trimby, 1979). Within the educational setting needs assessment yields information which can be used in educational planning, in problem-solving, for making education decisions, for accountability, and for supporting applications for funding. Therefore the information and data obtained from a needs assessment can be used to design, implement, and evaluate instructional products or programs (Trimby, 1979).

Evaluation can be an integral part of the needs assessment process. In the systems approach to educational development, the first step would be needs assessment or the establishment of the goals and general directions and the last step would be evaluation in which the goals and actions set by the needs assessment are tested (Trimby, 1979). Through the use of this procedure Kaufman hopes to help others avoid poor decisions in designing a curriculum and thus improve the effectiveness of educational planning (Kaufman, 1975).

Kaufman suggested that needs data be collected by standardized tests, criterion-referenced tests, observations, interviews, Delphi techniques, critical incidents, census data, employment data, and polls (Kaufman, 1975). The data should then be summarized using input from the learners, educators, and the community.

Lee felt that the basic purpose of assessing educational needs of students is to provide a data or information base for educational decision-making (Lee, 1973). He defined needs assessment as a process by which the unfulfilled educational requirements of a population of students are identified. It is a means of determining the educational objectives most appropriate for a particular situation (Lee, 1973).

Lee concluded that based upon the gaps, one may determine (a) what should be changed to be responsive to the "needs" and (b) what should be continued to ensure that successful efforts and useful results currently being achieved do not get eliminated. Decisions can then be made to determine what alternative ways and means may be considered to close the gaps that should be closed and continue efforts that are currently successful. Decisions can also be made to determine which of the currently successful methods means to be continued. The best ways and means to achieve the results can be selected, implemented, and revised as required.

Sweigert's (1977) study assessing learner needs with criterion-referenced tests involved producing a combination of "hard" and "soft" information for use in instructional and administrative decision-making. The hard information came from tests that were designed to measure the extent to which students had achieved a degree of mastery in respect to learning objectives in a wide variety of areas, and the soft information

came from a broad-based survey of the relative importance of the objectives. He used the general goals of education from his state as the starting point, and sought the answers to two questions within the study included: a) are students learning what they are being taught? and b) are students being taught the right things? He proposed that more attention would be given to the second question.

Sweigert, using Kaufman's concept of need as a discrepancy between "what is" and "what is required or desired" derived the following definition of learner needs: "Learner needs are discrepancies between what learning goals and objectives are offered in instruction and those that should be offered." A second definition of need, is proposed to be considered in tandem with the first, may be derived from Kaufman's general statement and the question regarding whether or not students are learning what they are being taught: "Learner needs are discrepancies between actual and desired levels of student achievement in respect to the learning goals and objectives that are judged to be important and are offered in instruction" (Sweigert, p.29).

To obtain a complete picture, both types of needs should be identified for a given population of students. Both "hard" and "soft" information are required to identify each type of need.

Sweigert (1977) suggested the following six steps in this assessment:

1. State importance of objectives.
2. Select appropriate test.
3. Administer test.
4. Identify discrepancies.
5. Restate objectives.
6. Outline plan of action.

Four elements are involved within the six steps. The first element would be a description of what is required or desired. The second element would be a description of what is. Since a discrepancy between what is and what is required does not exist in a vacuum, a third element would be a description of the student population having the need. The fourth and final element would be deciding the relative importance of meeting the need.

The case studies by Melton (1977) utilized a school based approach. Several lesson were learned from this needs assessment effort:

a. All teachers and administrators are not mentally, physically or emotionally ready for the rigors of change. Therefore, an important consideration should be the commitment of the staff to utilization of data accrued from the assessment efforts.

b. The concept of shared-decision making, or participatory goverance, is an important ingredient in the acceptance of needs assessment and the establishment of a climate for successful change.

c. The most detrimental force affecting the completion of the needs assessment process and its resultant changes was teacher fatigue.

d. The principal must be totally committed and involved in the process.

e. If an outsider consultant or facilitator is used in the conduct of the needs assessment, then consideration must be given to the development of emergent leadership from the staff so that the staff can assume leadership positions once the consultant leaves. If this is not accomplished, then the efforts may die.

When a program or project assessment is to be used the following should be noted:

a. It is extremely important in an assessment of this nature that the target group of a program be completely informed and involved in the process and be aware of its potential outcomes.

b. A statement of commitment from the target group will help insure that they do not feel like something is being done to them, but that they are part of an internally generated self-renewal effort.

c. No program or component of the school is so isolated that it does not reach and affect others. It is important to insure that there is a climate for change and the necessary cooperation to implement whatever is generated from the assessment process (Melton, 1977, pp. 38-40).

In summary, the literature review revealed that many school systems around the country have recognized the requirement for controlled and purposeful change to stimulate renewed thrust toward educational excellence. To establish the necessary foundations for planning and to base decisions on documented evidence, they have utilized the concept of needs assessment as the first step in the process of change. Once the learners' needs, interests, and abilities are established, well-designed learning experiences can be developed without taking unnecessary risk.

Motor Performance

Systematic gathering of data regarding the effectiveness of the physical education curriculum is essential to a dynamic physical education program. Maximum use of measurement and evaluation in curriculum development calls for teamwork and mutual understanding of purposes and procedures among all teachers in a school. Measurement is an integral part of the total school evaluation program, which should aim at the common goal of providing the best possible instruction for the students (Annarino, Cowell, & Hazelton, 1980).

A "physical educator's unique responsibility is to promote the motor development of each child" (Roberton & Halverson, 1984, p.41). Although they share interest in the child's cognitive, perceptual, psycho-social, and artistic development with every other teacher in the school, they have primary responsibility for the child's growth in the motor domain (Roberton & Halverson, 1984). Each child is recognized as being unique but similar to all children in developmental trend. If each child's motor development is to be planned and directed by physical educators, some method or methods of assessing the child's existing level of motor development is needed. The information gathered from such an assessment would enhance the teachers' ability to develop appropriate objectives for their class and to determine to what extent their existing objectives have been achieved (Annarino, Cowell, & Hazelton, 1980).

It has long been asserted that the study of motor performance in the early school years, and in preschool years, is needed not only for understanding children of these ages but for understanding motor development throughout the years of physical growth (Glassow & Krause, 1960). Further, current authors believe that if teachers have an understanding of children's motor development, they become better observers, interpreters, and directors of the children's developmental process (Roberton & Halverson, 1984).

In order to achieve a better understanding of childrens' motor development, considerable attention has been given to motor functioning in preschool years to provide information relative to patterns or sequences of development and age expectancies (Bayley, 1935; Gutteridge, 1939). This line of research has provided assessment of developmental progress in relation to the child's ability to move and manipulate his environment (Keogh, 1965). Studies have also been made of motor functioning from pre-adolescence through young adulthood. These studies included variables of fitness measures, age change, sex, and relationships to other variables such as physique and personal-social measures (Espenshade, 1940; 1960).

Bachman (1961) conducted a study to determine the influence of age and sex on motor performance and the amount and rate of learning. He found that the amount of learning was unrelated to sex and that the rate of learning was not influenced

by age or sex over the range of 6 to 26 years of age. The amount of learning was observed to increase during the adolescent period. Performance level varied considerably with age and was found to be relatively poor in post adolescent females.

There is a distinct lack of wide scale testing in motor proficiency and health-related fitness for K-3 children. Many of the studies which have been reported provided conflicting results when age mean or median figures were compared, and some data were not useful for comparative purposes because of marked differences in data collection procedures (Keogh, 1965). A problem plaguing attempts to evaluate motor abilities of young children is the variable nature of their performance, which affects test reliability. It is not uncommon for groups of children of the same age tested by different researchers to show dissimilar average scores on the same performance test (Rarick, 1973).

The foundation for children's motor performance can be organized into at least two distinct categories of basic motor abilities and health-related fitness (Pissanos, Moore, & Reeve, 1983). An important aspect in the study of motor development is the determination of factors which contribute to the motor performance of the child (Pissanos et al., 1983).

Motor Proficiency and Motor Performance Studies

Prior to the development of the Bruininks-Oseretsky Test of Motor Proficiency, Bruininks (1978) completed a comprehensive review of studies that investigated the motor performance of children and adults (Cratty, 1970; Espenshade & Eckert, 1967; and Rarick, 1961). In addition, a number of primary research reports were also reviewed to identify the tasks of childhood and adolescence judged to be significant indicators of motor development. Some of the major areas of emphasis were identified through reviews by Bruininks (1978, p.17), he cited the studies noted as follows:

> Maintenance of body position is essential in most acts of movement and skilled performance, such as running, throwing, jumping, and striking objects (Bruininks, 1974; Cratty, 1970; Fleishman, 1964).
>
> Coordination of visual tracking with movements of the arms and hands is needed for successful catching and throwing (Kephart, 1971).
>
> Speed of response is an important psychomotor ability (Cratty, 1967; Fleishman, 1964; Guilford, 1958).
>
> Integration of visual-perceptual responses with highly controlled motor responses is required for success in reading and handwriting (Bruininks, Sullivan, & Short 1974; Wedell, 1973).
>
> Precision and speed of fine motor movements are essential components of skilled motor performance in vocational activities, play, and sports (Bruininks, 1974; Cratty, 1967, 1970; Fleishman, 1964; Guilford, 1958; Harrow, 1972).

Factor-analytic studies of the structure of motor abilities by Fleishman (1964), Guilford (1958), Harrow (1972), and Rarick et al. (1976) provided additional help in identifying significant aspects of motor functioning. After Bruininks completed the review of the developmental tasks and factor-analytic studies, he selected nine qualitatively different aspects of gross and fine motor development to serve as guides for the development of his test content:

GROSS MOTOR ABILITY

1. Gross Motor Speed-- the ability to maintain a high degree of speed during a brief shuttle run
2. Static Balance-- the ability to maintain body equilibrium while stationary
3. Performance Balance-- the ability to maintain body equilibrium while moving
4. Coordinated Movements-- the ability to coordinate the hands and feet in simultaneous or sequential movement patterns
5. Strength-- the ability to perform tasks requiring the use of certain arm, leg and abdominal muscles

GROSS AND FINE MOTOR ABILITIES

6. Visual-Motor Coordination-- the ability to coordinate visual tracking with both gross and fine movements of arms, hands, and fingers

FINE MOTOR ABILITY

7. Response Speed-- the speed with which a hand stops a moving stimulus
8. Visual-Motor Control-- the eye-hand coordination required to perform a number of paper-and-pencil tasks
9. Upper-Limb Speed and Precision-- the ability to move the arms and hands quickly with manipulative dexterity and precision.

The Broadhead and Bruininks (1982) study attempted to identify the childhood motor performance traits on the short form of the Bruininks-Oseretsky Test of Motor Proficiency. The results indicated that over the span of 5 through 14 years of age, the mean performance curves for both boys and girls were markedly linear for all the 14 test items which comprised the 8 subtests of motor proficiency represented in the test. These trends supported those previously reported for gross motor ability traits by Espenshade and Eckert (1980), and Rarick (1973); for fine motor ability traits, as reported by Keogh (1965), and Wickstrom (1977), and also for gross and fine motor traits similar to the works of Rarick, Dobbins and Broadhead (1976), and Williams (1983).

Sex differences in mean performance were demonstrated for eleven of the fourteen test items. On none of the three items assessing the visual-motor control component of fine motor ability were sex differences within an age group noted. For the four gross-motor ability subtests the single item assessing strength, and that assessing running speed and agility, showed significant differences which favored the boys, while on the items assessing balance and bilateral coordination, the isolated differences favored the girls. With the two gross-and fine-motor subtest items a single significant difference favoring the mean level of performance of the boys was shown. For fine-motor ability a single difference which favored the boys occurred on

response speed, while clear and consistent differences favoring the girls were noted on both items assessing upper-limb speed and dexterity.

Bietel and Mead (1980 ; 1982) report that for 3- 4- and 5-year olds the short form and the eight subtests were significantly related to age. No significant sex differences were found on either the short form or on subtest scores. The short form accounted for 96 percent of the variability of the complete battery; thus the short form can be substituted for the complete battery whenever appropriate.

AAHPERD Health-Related Fitness Test

For young children the commonly defined fitness components of endurance, flexibility, and strength are by products of learning the fundamental motor skills essential for locomotion and play (Seefeldt, 1984). But can physical educators expect fitness just to happen? This is a question that must be answered.

Ross and Gilbert (1985) reported that the most recently developed AAHPERD Health-Related Fitness Test (1980) measures aspects of fitness that are related to and predictive of health. The Health-Related Fitness Test has been used to assess current fitness levels and to prescribe exercise and activity programs and to monitor changes in fitness over time. The four fitness

tests measure one or more specific aspects of an individual's current health and potential resistance to disease. The sit-and-reach test and the sit-ups primarily indicate the likelihood of an individual's developing a lower back problem due to inadequate flexibility and or poor abdominal strength. The mile walk/run measures the generalized capacity of the cardiovascular system, which may increase an individual's resistance to heart disease. An individual's degree of body fatness, as shown by skinfold thickness, helps to predict vulnerability to a wide range of degenerative diseases, including hypertension, heart disease, diabetes, psychological disorders, and impaired tolerance for heat.

The common belief is that boys' performances on physical fitness tests tend to peak shortly after puberty and then reach a plateau for the remaining school years. The performance of girls supposedly peaks at roughly the onset of puberty and then rapidly declines. At any age, the typical boy is thought to be capable of outperforming the typical girl on almost any test of fitness (Ross, Dotson, Gilbert, & Katz, p. 67).

When comparisons were made between the norms of the AAHPERD Health-Related Fitness, the AAHPERD Fitness and the National Children and Youth Test Youth Fitness Study the following findings were reported. For boys, it appears that times on distance events level off or decline slightly at approximately age 15 or 16. But on all other measures of

fitness, boys tend to improve from age 10 to 18 at a fairly constant rate. Boys can do more sit-ups and chin-ups/pull-ups, can stretch farther, and have less body fat as they reach the older teens.

For the girls, times on distance events peak somewhere around age 14 and then either decline or level off. Upper body strength and endurance appears to remain constantly low. Abdominal strength and flexibility appear to improve with age. Similarly, although girls' body fat increases with age this pattern decelerates around age 15 (Ross, Dotson, Gilbert, & Katz, 1985).

Other studies relating to fitness and motor performances are reviewed in the following paragraphs:

Hyde (1975) found no significant differences between females and males for any age group in kindergarten children she tested. Milne, Seefeldt, and Reuschlein (1976), however, reported that males in kindergarten, first, and second grade had significantly better performance than females on test items of agility, speed, power, and endurance. Females had better performance scores on flexibility.

Pissanos et al. (1983) designed a study to determine the contribution of age, sex, and body composition to children's motor performances on the selected basic motor tasks of balance, speed, agility, power, coordination, and reaction time; and the health-related fitness items of flexibility, muscle strength and

endurance, and cardiovascular function. They found that age was a significant factor in predicting performance on all variables except muscle strength, endurance, and flexibility for children in grades one, two, and three. Sex significantly predicted performance only for flexibility and cardiovascular function, and body composition significantly predicted the power and cardiovascular function variables.

Hensley, East, and Stillwell (1982) investigated the relationship between selected physical performance tests and body fatness in preadolescent boys and girls. They found a significant difference between boys and girls on all of the physical performance tests. The boys exhibited slightly higher performance levels than the girls. Body fatness was only marginally related to performance with the exception of the modified pull-up test. Therefore, it was concluded that body fatness was of minimal importance in explaining performance differences between young boys and girls.

Cureton, Boileau, and Lohman (1975), reported that the relationship between body composition measures and the AAHPER test performance in young boys significantly increased the variance accounted for above that explained by age, height, and weight in predicting all performance items except sit-ups. They also found that the AAHPER Youth Fitness Test was the most widely used test of motor fitness for children and adolescents in the United States. It was the only fitness test found by these researchers for which there were national norms.

In summary, the literature reviewed indicates that the physical educators' unique responsibility is to promote the motor development of each child. In order to fulfill this responsibility, a study of motor performance characteristics of young children is needed. There is a lack of reported studies concerning the motor proficiency and health-related fitness of K-3 elementary school children. An important aspect in the study of motor development was the identification of determining factors which contribute to the motor performance of the child. Bruininks provides us with a comprehensive review of studies related to this area.

The foundation for children's motor performance was organized into two distinct categories of basic motor abilities and health-related fitness. The identification of factors that influence performance of motor abilities and health-related fitness items provides necessary information for teachers and curriculum planners for physical education for young children.

Measurement and Evaluation in the Motor Domain

In the past, the primary purpose for testing children in elementary school physical education was to screen them for placement either in adaptive programs or regular physical education classes. It has been observed that a lack of measurement and evaluation tools to assess the motor performance of elementary school children exists (McGee, 1984).

Measurement and evaluation within the physical setting should be a dynamic and an ongoing process. The physical educator is continually making judgments about the child's motor performance. The two types of measurement techniques used by the physical educator are summative and formative evaluation (Barrow & McGee, 1979). In summative evaluation one makes judgments about the final product, for example, if the child can catch a ball. In formative evaluation one investigates the process of the performance, for example, what form the child used when attempting to catch the ball. Both types of evaluation are necessary for the physical educator to gain a clear picture of the child's motor performance (McGee,1984).

The factors most frequently measured by physical educators are physical performance factors: a) factors that are basic to all performance such as agility, power, speed, arm and shoulder coordination, balance, and flexibility; b) fundamental movements which include locomotor, nonlocomotor and manipulative skills; and c) highly specialized movements such as sport activities (Baumgartner & Jackson, 1982). The physical performance test is defined as those objective tests used to measure human movement including motor ability, motor fitness, sport skill, posture, and nutrition (Baumgartner & Jackson, 1982).

In the motor domain the question of test selection is a difficult one, for there are few standardized batteries of tests

which evaluate a sufficiently broad range of performance for a valid decision to be suggested with any certainty about the child's performance (Broadhead & Bruininks,1982). Test selection should be based on the appropriateness of the test for the teacher's specific purpose, and the teacher should have a purpose or purposes for testing and refer to those purposes in interpreting test results (Barrow & McGee, 1979).

The following are some of the purposes of assessment in physical education :

1. To diagnose weaknesses.
2. To classify according to ability.
3. To exempt from aspects of the program.
4. To predict future ability level.
5. To determine achievement level.
6. To specify amount of improvement.
7. To motivate students.
8. To determine grades.
9. To evaluate teaching.
10. To justify programs to administrators.
11. To evaluate the curriculum (Safrit, 1983).

The North Carolina State Department of Public Instruction (1983) has stated that evaluation is a process by which progress toward the goals or objectives of physical education can be determined. Assessment, therefore, is a needed process to ensure that program goals and objectives are being achieved.

Summary

From the studies reviewed in this chapter it appears that there is a continuing interest among researchers in the motor performance of young children. In particular the studies

reviewed focused on identifying motor performance factors and needs assessment techniques which could be reasonably assumed to be valid, feasible, and recommended for use in conducting a needs assessment in physical education. The literature on measurement and evaluation gives encouragement to the value of needs assessment in physical education.

CHAPTER III

METHODS AND PROCEDURES

The purpose of this study was to use tests of motor proficiency and health-related fitness to assess selected motor needs of the children in a K-3 elementary school and to establish a baseline for the development of physical education instructional objectives for these children.

In order to accomplish the purpose of this study, a needs assessment was proposed. Motor performance data were obtained to evaluate and describe the children's present motor performance characteristics.

The general method of the study was a descriptive design. Quantitative data were collected, analyzed, and interpreted about student motor behavior. Only motor performance scores were used in the student assessment phase of this study. Qualitative data were collected, analyzed, and interpreted from teacher responses about the helpfulness and practicality of the needs assessment data.

Since the study was designed to assess motor proficiency and health-related fitness needs of children and to establish a baseline for the development of physical education instructional objectives from the motor performance data, the following specific parts were necessary:

1) The assessment of the motor proficiency and the health-related fitness status for an entire K-3 elementary school;

2) An organization of the motor proficiency data and the health related fitness data of the children by age, sex, grade and classroom;

3) An interpretation of the motor proficiency and the health-related fitness scores for the classroom teachers in order to introduce the use of selected motor assessment data for the development of physical education objectives;

4) A series of discussions with the classroom teachers concerning the helpfulness and practicality of specific motor proficiency and health-related fitness testing in establishing a basis for developing their instructional objectives.

In the remainder of this chapter the research steps are more fully explained and the procedures that were followed in the collection and analysis of the obtained data are discussed.

Instrumentation

There is little printed information concerning the motor proficiency and health-related fitness of K-3 elementary school children. One reason for this may be that there are only a few standardized batteries with which to evaluate a sufficiently broad range of the children's motor performance upon which to make valid instructional decisions.

In order to assess two significant aspects of motor performance in selected K-3 children two instruments were selected for the present study. The measurement tools chosen to assess the motor proficiency and health-related fitness of elementary school children were the Bruininks-Oseretsky Test of Motor Proficiency and the AAHPERD Health-Related Fitness Test.

The Bruininks-Oseretsky Test of Motor Proficiency has been used in the past with children 4 1/2 to 14 years of age. The test was designed to determine a child's level of general motor development and to assist curriculum planners in making decisions about educational objectives. The short form of the test yields a single motor proficiency score, each item may also be interpreted.

The originator of the Bruininks-Oseretsky Test reports that test validity was determined by construct validity in the relationship of the test content to significant aspects of motor development cited in research studies, the relevant statistical properties of the test, and the functioning of the test with contrasting groups of handicapped and normal children (Bruininks, 1978, p.28).

The test-retest reliability method has been used to estimate test reliability. Test-retest reliability for the battery composite was reported as .89 for second graders and .84 for six graders using the reliability coefficient and the

standard error of measurement statistics. The standard error of measurement has a mean of 50 and a standard deviation of 10. The average reliability estimates for the two groups on the test and composites were obtained by means of Fisher's z-transformation (Bruininks, p. 36). For the interrater (test administrator) reliability, the authors reported a median product-moment correlation of .98 and .90 for the two groups of raters. The intercorrelations among the subtest of the short-form battery composite yields .91 (Bruininks, 1978, pp. 35-40).

According to the publication materials the test norms were established by using a multistage sampling procedure to ensure adequate representation in terms of age, sex, race, and size of the community (Bruininks, 1978, pp. 25-34). Appropriate representation of various socioeconomic backgrounds were also included in the sample. The norms enable the researcher to convert composite scores and subtest scores to age-based standard scores, percentile ranks, stanines and age equivalents scores (Bruininks, 1978, pp. 135-138).

A review of the practical considerations of the test revealed the following: (a) the short form of the test consists of 14 items; (b) the time requirements for the test are 30 minutes for setting up the testing stations and 20 minutes for test administration; (c) a gymnasium is needed for the testing site; (d) the equipment needed requires a self-contained test kit and the Short Form Individual Record Sheets; and (e) the Test Kit and Record Forms must be purchased.

The AAHPERD Health-Related Fitness Test has been used with children 5 to 18 years of age. It has been used to diagnose strengths and weaknesses of students, to determine the achievement of program objectives, and for program evaluation.

The AAHPERD (1980) test validity was determined by construct validity and logical validity. The test reliability was established by the test-retest method. The test-retest reliability was reported as .68-.94 using the correlation coefficients for between-trial comparisons.

National norms were established in 1979 for the AAHPERD Health-Related Fitness Test. The norms represent percentile norms for each of the test items with reference to age and sex.

The practical considerations for this test include the following: (a) the test is made up of four items; (b) it requires approximately 30 minutes to set up the testing stations and two class periods to administer the test; and (c) a gymnasium is needed for the indoor items, and a track, or level running surface, is needed for the 9-Minute Run.

The equipment required for the test includes mats, a stopwatch, a sit-and-reach bench, skinfold calipers, and individual score cards. The skinfold calipers may be purchased from a variety of vendors, and the individual score card must be designed by each researcher.

Another special consideration when selecting this test was the recommendation that the same tester should administer the skinfold test to all children. Also, in order to comply with school policies, the children had to be measured over their outer clothing.

Pilot Study

In order to familiarize the investigator with the procedures of the tests and to get more understanding about children's reactions to the tests a pilot study was conducted.

Following human subjects clearance procedures at UNC-G (December 15, 1983), children in grades K-3 at George Watts Elementary School in Durham, N. C. were asked to participate in a pilot study (Appendix A). Parental consent forms were filed with the principal at George Watts Elementary School. A copy of the consent form is included in Appendix B. One class from each of the target grade levels participated in the Bruininks-Oseretsky Test of Motor Proficiency and the AAHPERD Health-Related Fitness Test. The purpose of the pilot testing was to familiarize the investigator with the administrative procedures of the tests, estimate the time allotments for each test item, and judge the reaction of children of the target age group to the testing procedures.

One outcome of the pilot study was the finding that with an adequate number of trained test administrators the time allotment projected for this study (three 30-minute periods) should be sufficient to complete the planned needs assessment. Another outcome of the pilot study was the realization of a need to develop a consistent method to introduce the test items to the children. A slide presentation was developed by the investigator for this purpose. It was reasoned that a visual image of the test items should help the young children better understand both the tasks and the verbal explanations.

Slide Presentation

Slides depicting the test items on the Bruininks-Oseretsky Test Of Motor Proficiency and the AAHPERD Health-Related Fitness were prepared using children from the pilot test school as models. Permission was requested from and granted by the parents for each child's participation as a model. The format for the slide presentation followed the illustrations outlined in the two test manuals and depicted each of the test items to be used in the study. A copy of the slide presentation format and pictures of the slides are included in Appendixes C and D.

The slide presentation was to be shown to the students at the Green Grove research site during the week prior to the first

testing session. At this time it was arranged that the investigator would talk with the students about the test and answer their questions. The teachers were encouraged to prepare their class further by using the slide presentation on the days that their class was not tested. The slides were kept in the principal's office and made available for the teachers.

Selection of the K-3 School

In order to conduct a needs assessment study, it is extremely important that the target group of the study be completely informed and involved in the process and be aware of its potential outcomes. The principal and teachers must be totally committed. They should be assured that they will be involved in the shared-decision-making process. The total school population should be involved in the assessment (Melton, 1977).

The following three general criteria were used to locate a suitable site for the study. The first criterion was that the principal's endorsement of a needs assessment study seemed assured. The second criterion was that the classroom teacher was responsible for the physical education program for her class and that she wanted more information about the motor performance characteristics of her children. Insofar as practical, a large K-3 school population was needed to achieve the third criterion which was to gain a "realistic" view of the assessment process in a public school setting.

The selection of Green Grove Elementary School resulted from a process of elimination through correspondence and a series of meetings with Mr. Purnell Swett, Superintendent of Robeson County Schools North Carolina (Appendix E). In the 1983-84 school year Robeson County had two schools which were defined by grades K-3. The school which was selected was the smaller of the two having a school population of 321 children. The alternate school was larger but was involved in another testing project. Further, Green Grove had three class sections for each grade level K-3. The school also contained one combination second and third grade class. Each classroom teacher was responsible for the physical education program for her individual class. All 13 classroom teachers and the principal were to be involved in the study. Thus, Green Grove was selected because it met all of the desired conditions for the study. (See correspondence Appendix E). After approval by UNC-G Human Subjects Committee Review procedures (February, 1984), parental consent was obtained for each child in the study. The Robeson County school policies and procedures for research in schools were followed. A copy of the parental consent form is included in Appendix B.

Training Sessions for Testing Personnel

The number of elementary students to be tested and the length of the test made it necessary to select and train a testing staff. Since Pembroke State University was the closest

university to the testing site, Professor Tommy Thompson, the tests and measurement instructor in physical education, was contacted in reference to selecting undergraduate physical education majors to assist in the administration of the selected tests.

Mr. Thompson volunteered to screen the physical education majors for responsible and reliable workers. From the recommended students, ten students were selected for primary testers and three students were selected as alternate testers. These students were informed that they would be paid for their services.

The training sessions were conducted on the afternoons of March 27 and 28, 1984 at Pembroke State University. All of the 13 students selected were present.

The March 27 training session was used to introduce the student trainees to the two tests. The slide presentation of the test items was shown and questions were answered concerning the tests. Following the question-and-answer period, the testing stations were set up, and the trainees administered the test items to each other. The trainees selected the test item for which they would assume responsibility during the test administration.

An 8 X 5 instructional card was provided for each tester to use. The instructional card included test administration steps and recording procedures. The testers were instructed to follow the published test procedures and their proficiency was

observed until they reached a criterion of consistent and confident repetition. The investigator observed the testers during several practice trials until each tester demonstrated the test instructions with ease and confidence. Each tester was to be responsible for administering only one test item to all the children. The alternate testers learned to administer all of the test items.

The March 28 session was used to review and practice the administrative procedures of the test items. The testing stations were set up and the student testers practiced administering the test items to each other. The testers were reminded of the importance of the study and had a final review on the correct testing procedures. All questions were answered and the Pembroke State University students were given directions to reach the school and a copy of the testing schedule. No trainee item or rater reliability statistical measures were done.

Preparation of Score Cards and Test Materials

Before the elementary children could be tested, individual test packets would have to be assembled. The test packets contained an Individual Score Card for the AAHPERD Health-Related Fitness Test and Individual Record Form,(Short Form), and Individual Student Booklets for the Bruininks-Oseretsky Test of Motor Proficiency.

The published Individual Record Form (Short Form) for the Bruininks-Oseretsky Test of Motor Proficiency was prepared

for each child. Permission was granted from the American Guidance Services to copy four test items from the published Student Booklet. The test items which were included were the three pencil-and-paper items from Subtest 7 which included drawing a line through a straight path with the preferred hand, copying a circle with the preferred hand, and copying overlapping pencils with the preferred hand and one from Subtest 8 which included making dots in circles with the preferred hand. Individual Student Booklets were organized and printed. In accordance with the conditions of the publisher's permission, all copied materials were to be destroyed after the test results were recorded (Appendix F).

A Score card for the AAHPERD Health-Related Fitness Test was designed by the investigator. The cards were printed on 8 X 5 index cards. The personal data included on the score card included the child's name and grade, each test item, the raw score for each item and the percentile score for each item. An individual score card was made out for each child.

The AAHPERD Health-Related Fitness Test required the use of a sit-and-reach bench. Two sit-and-reach test apparatuses were constructed. The procedures outlined for this construction by the AAHPERD Health-Related Fitness Test Manual were followed (pp.68-69). Special equipment was also needed for the 9-Minute Run because the school had no track. The supplementary supplies included the following: (a) flag football belts to be worn by the K-3 students which were secured from Pembroke State

University; (b) chalk to mark a running course; (c) cones to mark 100-foot intervals; and (d) a measuring wheel which was obtained from the local town manager.

Administration of the Bruininks-Oseretsky Test of Motor Proficiency and the AAHPERD Health-Related Fitness Test

All tests were administered during the weeks of April 5 through April 20, 1984. A total of two weeks and two days were allotted for the testing period. The regularly scheduled physical education period was used for the testing period. All testing sessions were held after 12:30 p. m. each day. The Bruininks-Oseretsky Test of Motor Proficiency was administered to all students during the first testing period for each class. Each class was scheduled for three days of testing. An additional testing time was needed for the three kindergarten classes. These classes had the largest enrollment and more time was required in administering the tests to them. For each class there was an interval of at least three days between testing sessions. A copy of the schedule for testing is included in Appendix G.

Special arrangements were not made for the children to wear gym clothing for the testing sessions. For the measurement sessions, ten testing stations were set up. A layout of the testing site is included in Appendix H. As the children came in the gymnasium, the classroom teacher helped the investigator

distribute the score cards or data sheets. The children were then divided into groups of twos or threes. Each group started the test at a different station and was rotated to the next station in a counterclockwise fashion. The investigator, the classroom teacher, and the teacher's aide monitored the children's rotations. After the children completed all of the tests, they sat down in a designated area where the scoring materials were collected, and the children had a chance to ask questions and talk with the investigator and testers.

Throughout the testing sessions, periodic checks were made by the investigator to ensure that the outlined testing procedures were being carried out by the testers.

At each test station the students' raw scores were recorded on the Individual Record Form or Individual Score Cards by the testers. Later the raw scores were converted by the investigator to standard scores, percentile scores, stanine scores and composite scores for the Bruininks-Oseretsky Test of Motor Proficiency. The raw scores for the AAHPERD Health-Related Fitness were entered on the data card and later converted into percentile scores only.

The only test item which was modified in order to meet the conditions of the location was the 9-Minute Run. A track was not available at the school: therefore, the 9-Minute Run was run on a 1320-foot playground circuit. Cones were used to mark 100-foot intervals. Flag football belts were worn by the

students. Each time the young student ran past the starting point, one ribbon was removed by a testing assistant. The students were instructed to stop and sit down when the whistle was blown. A measuring wheel was used to measure each child's additional distance past the nearest 100-foot mark. The number of flag football ribbons missing from the child's belt plus the recording wheel distance equaled the distance the child covered in nine minutes.

Analysis and Interpretation of the Student Data

All scores from each class were recorded on IMB Assembler Coding Forms by the investigator. The assessment scores were now ready for analysis. In order to proceed to the next research phases involving teacher discussions and the consideration of their responses, student assessment data analysis had to be completed.

However, since the purpose of this study was to use tests of motor proficiency and health-related fitness to assess selected motor needs of elementary school children and to establish a baseline for the development of physical education instructional objectives, the subproblems required separate analysis.

The research problem asked: "Do classroom teachers in a selected school view a motor proficiency and health-related

fitness data base as being useful in developing physical education objectives?"

In order to accomplish the purpose of the study and to substantiate the answer to the research problem, the following data collection and statistical analyses were necessary.

Subproblem I: "What is the status of K-3 children on the motor proficiency and health-related fitness tests?"

Descriptive statistics were used to present and interpret the results of this first question in the investigation. The raw scores were recorded and converted into the appropriate standard scores and presented as follows:

(a) Bruininks-Oseretsky Test of Motor Proficiency
    (1) standard score
    (2) percentiles
    (3) stanine

(b) AAHPERD Health-Related Fitness Test
    (1) percentile scores.

The following statistics are presented for each test item by age, sex, classroom and grade:

1. Means were computed for each test item in reference to each age group, to each sex, and in reference to combined age and sex.

2. Means, median, range, standard deviation, and standard error of measurement were computed and reported for each test item and for the independent variables of age, sex, grade, and classroom. Histogram frequency charts presented the percentile scores for the independent variables of grade and sex.

Nonparametric statistical analyses were used to strengthen the interpretation for describing the performance scores of the students from the school on the two test batteries. The following statistics were used to reveal differences between groups of children, if any exist, when considering their age, sex, classroom and grade placement:

1. Mann-Whitney U-Test was used to determine whether the medians of the two independent research groups of all males and all females differed from each other to a significant degree on any particular test score or set of test scores, thus providing a comparison on a measure of central tendency.

2. Kruskal-Wallis One-Way Analysis of Variance was used to determine whether the distribution of scores among the two research groups of age, sex, grade, or classroom differed from each other to a significant degree on any particular test score or set of test scores. The alpha level of .10 was used to compute and report any significant differences.

3. Pearson Product-Moment Correlations were computed to show to what extent item test scores were related to each other in this research group. An intercorrelation matrix was proposed that would show the relationships among the 18 test items by age, sex, and grade for this selected group.

Completion of these data analyses meant that performance scores could now be used in the next two phases of the study with the classroom teachers at Green Grove School. Phase one of the

teacher follow-up process consisted of a data interpretation session with all of the teachers collectively. Phase two consisted of a classroom data interpretation session and an interview session with each individual classroom teacher.

Teacher Questionnaire

In order to accomplish the teacher response phase of this study, a Teacher Questionnaire was designed by the investigator to elicit information from the teachers about what they thought were important objectives for their physical education classes and to determine whether the teachers thought the two tests given provided needed information for them. The Teacher Questionnaire consisted of two parts. In Part I of the questionnaire teachers were to rank the physical education goals for North Carolina Public Schools as stated by documents from the State Department of Public Instruction (1983). Part II of the questionnaire consisted of a Likert Scale to ascertain the classroom teachers' favorable and unfavorable attitudes about the two tests just given to their classes and to gain their opinions about the idea of "needs assessment" in physical education.

The Teacher Questionnaire was submitted to a panel of experts to determine the clarity and objectivity of the questions. The following people served as judges:

Dr. Rosemary McGee (UNC-G) Test and Measurement Specialist

Dr. Ross Townes (NCCU) Test and Measurement Specialist

Dr. Shirley DeLucia (NCCU) Director of Elementary School Education

Ms. Susan Strickland (George Watts Elementary School) Physical Education Teacher

A revision of the questionnaire was obtained by using the combined suggestions of the experts (Appendix K).

Administration of Teacher Questionnaire and Teacher Interpretation of Data

In order to gain a measure of the teachers' preassessment ranking of goals for physical education, the first part of the Teacher Questionnaire was given to the teachers before there was any testing of any children at Green Grove School. This called for the teachers to rank North Carolina physical education goals as officially stated. A post-assessment measure of this opinion was taken after all of the following were completed: (a) the children's testing sessions; (b) the group interpretation session; and (c) interpretation of individual classroom results. Any differences in her pre- and post-assessment ranking were discussed with the teacher in her personal interview so that the teacher could explain her rationale in relation to the selection of the physical education goals.

In order to address Subproblem II: "To what extent do classroom teachers report that the motor proficiency and the health-related fitness test data could be useful information for

the development of K-3 physical education objectives?" and Subproblem III: "How helpful and practical do the testing strategies developed in Subproblem I seem to be for the future use by teachers at the selected school?", the following order of events was needed: (a) administration of Part I of Teacher Questionnaire to teachers, (b) student data collection and analysis, (c) interpretation of student data with all the teachers, (d) discussion of individual classroom data, (e) administration of Parts I and II of Teacher Questionnaire to teachers, and (f) interview sessions with each teacher.

Having completed the first two phases of the events, an interpretation session was scheduled on May 24, 1984 during a regularly scheduled faculty meeting. All teachers were present. The faculty group consisted of 13 female teachers. The purpose of this meeting was to discuss the school-wide motor proficiency and the health-related fitness test scores with the teachers in order to introduce them to the idea of the use of selected motor assessment data in the development of physical education objectives. The meeting lasted one hour. At the end of the meeting the teachers signed up for their interview sessions.

The interview sessions were scheduled on June 11 and 12, 1984 during Teacher Work Days at the end of the school year; this reflected a time lapse of six weeks between student assessment and teacher response. During the interview sessions, the

investigator spent approximately 30 minutes with each individual teacher.

Each interview session followed the same procedure. Step one involved a discussion with the teacher about her individual classroom test results. She was then asked to complete Part I and II of the Teacher Questionnaire. An interview session followed with the purpose of allowing the teacher to discuss her expressed opinions concerning the helpfulness and practicality of specific motor proficiency and health-related fitness testing for use as a basis for developing instructional objective. The reasons for her various answers and the details of her answers followed. Key concepts were identified from Part II of the Teacher Questionnaire and each teacher was asked if she understood the terms. The concepts which were identified included motor proficiency, health-related fitness, and specific motor needs of children. The teacher was also asked to explain her reasons for the way she ranked the official State of North Carolina physical education goals.

Some of the teachers' comments were recorded on tape and discussed in a narrative form (e.g., ascertaining if they seem to understand that "needs assessment" might be appropriate in physical education using testing, faculty discussions, and interpretation of scores). The majority of the teachers preferred to discuss the questions openly without being taped.

In these cases teacher's responses were recorded immediately after the interview session. The information and data gathered from the teachers were to be discussed in a narrative form and were not be subjected to statistical analysis.

The quantitative student assessment data and the qualitative teacher response data following from these procedures are presented in the next chapter.

CHAPTER IV

THE DATA AND ANALYSES

The purpose of this study was to use tests of motor proficiency and health-related fitness to assess selected motor needs of elementary school children and to establish a baseline for the development of physical education instructional objectives.

The research problem was cast in the following question: "Do classroom teachers in a selected school view a motor proficiency and health-related fitness data base as being useful in developing physical education objectives?" A particular K-3 school in Robeson County, North Carolina was selected as the school in which all aspects of the main study were researched.

In order to accomplish the purpose of the study and to substantiate the answer to the research problem, the following data collection and statistical analyses were necessary.

Subproblem I: "What is the status of K-3 children on the motor proficiency and health-related fitness tests?"

Descriptive statistics were used to present and interpret the results of this first question in the investigation. The raw scores were converted and are presented as follows:

(a) Bruininks-Oseretsky Test of Motor Proficiency:
(Raw scores were converted in point scores.)
  (1) standard score
  (2) percentile rank
  (3) point score total
  (4) stanine

(b) AAHPERD Health-Related Fitness Test
(1) percentile scores.

The following statistics are presented for each test item by age, sex, grade, and classroom:

(a) Means were computed for each test item in reference to each age group, to each sex, and in reference to combined age and sex.

(b) Median, range, standard deviation, and standard error of measurement were computed and reported for each test item and for each of the variables of age, sex, grade, and classroom.

(c) Histograms of the percentile ranks of the Bruininks-Oseretsky Test of Motor Proficiency and the percentile scores of the AAHPERD Health-Related Fitness Test are presented in reference to the variables of sex and grade.

This analysis is called the descriptive school-wide overview and is presented and explained in Tables 1-19.

Nonparametric statistical analyses were used to strengthen the interpretation for describing the relative performance scores of the students from the school on the two test batteries. The following statistics were used to reveal differences between groups of children, if any existed, when considering their age, sex, grade placement, and classroom:

(a) The Mann-Whitney U-Test was used to determine whether the medians of the two independent student groups of

all females and all males differed from each other to a significant degree on any particular test score or set of test scores.

(b) The Kruskal-Wallis One-Way ANOVA was used to determine whether any two student groups of age, sex, grade, or classroom differed from each other to a significant degree on any particular test score or set of test scores.

(c) The Pearson Product-Moment Coorelations were computed to show to what extent test scores were related. An intercorrelation matrix was proposed to show the relationships among the 18 test items by age, sex, and grade.

An alpha level of .10 requiring a p = .00457 (two-tailed) was accepted for the degree of significance for the Mann-Whitney U-Test and the Kruskal-Wallis One-Way ANOVA. A high positive or negative correlation of .70 to .90 was used for the Pearson Product-Moment Correlations as the basis of discussion for important relationships among items (Hinkle, Wiersma, & Jurs, 1979). These analyses are referred to as the group comparisons and are reported in Tables 10-21.

Teacher Data

After the student data had been analyzed and interpreted for the teachers, the next two phases of the study could be completed. Research Subproblems II and III outline the questions to be answered and discussed from the information obtained from the teacher data. Subproblems II and III are as follows:

Subproblem II: "To what extent do classroom teachers report that the motor proficiency and the health-related fitness test data could be useful information for the development of K-3 physical education objectives?"

Subproblem III: "How helpful and practical do the testing strategies developed in Subproblem I seem to be for future use by the teachers at the selected school?"

Subproblem II and III were researched concurrently. In researching these questions the following steps were followed:

Step 1 was an interpretation session held with all of the classroom teachers. The purpose of this session was to discuss the motor proficiency and the health-related fitness test scores in order to introduce them to the idea of the use of selected motor assessment data in the development of physical education objectives.

Step 2 involved the administration of a Teacher Questionnaire which was followed by an interview session with each classroom teacher. The purpose of the interviews was to discuss their expressed opinions concerning the helpfulmess and practicality of specific motor proficiency and health-related fitness testing for use as a basis for developing instructional objectives.

The Teacher Questionnaire consisted of two parts. In Part I of the questionnaire each teacher was asked to rank the physical education goals as given. The source of the goals was

the North Carolina State Department of Public Instruction guidelines for grades K-12 (1983). Part II of the questionnaire consisted of a Likert scale to ascertain the classroom teachers' favorable and unfavorable attitudes about the two performance tests given to the children and to the idea of "needs assessment" as a basis for curriculum decision-making. Some of the teachers' comments were recorded on tape; however, the majority of teachers preferred not to be taped. The teachers' comments are dicussed in a narrative form so as to ascertain whether they seem to understand that "needs assessment" might be appropriate in physical education using testing, faculty discussions, and the interpretation of scores.

The data from the Teacher Questionnaire and the interview materials were summarized over all 13 participating teachers for analysis and discussion. These are included in the data-based analysis.

Since the purpose of this chapter is to present and discuss the statistical and interview results, the findings of the descriptive statistics, the Mann-Whitney U-Test, the Kruskal-Wallis One-Way ANOVA, and the Pearson Product-Moment Correlations are organized and presented according to the framing Subproblem I of this study. Subproblems II and III are discussed in a narrative form as the teachers' responses to the Teacher Questionnaire were coded and discussed. In the final section of the chapter is a discussion of the implications of the findings.

Student Data

Subproblem I: "What is the status of K-3 children on the motor proficiency and health-related fitness tests?"

Descriptive data were obtained to establish the motor proficiency and the health-related fitness status of the K-3 children. In order to present the descriptive data, the interpretation sections were organized into the two areas of educational significance and research significance. The interpretation of the data to the classroom teachers consisted primarily of the educational significance which dealt with a description of the overall school-wide results followed by detailed analyses of age, sex, grade, and classroom data. The teachers were given copies of this information for their records. Some of the teachers commented that even though the information was received at the end of the school year, it would still be useful in planning for the next year because the specific data representing age, sex, and grade would still describe most of the children at Green Grove School.

The research-significance section deals with an analysis and discussion of the statistically significant findings within the study. Emphasis was placed on the information regarding future research possibilities.

The 11-year-old children's data have been removed from the discussion because of the relatively small group size, one

female and seven males. Their data tended to distort the results of the interpretation.

Table 1 represents the results of the Combined Grade Data for the Bruininks-Oseretsky Test. Items 1-14 relate to the Bruininks-Oseretsky Test point score data and items 15 -18 relate to the conversion of the point scores to the standard score, total point score, percentile rank, and stanine score for each group of children. The conversion scores were interpreted by use of the age variable. The age variable for these items was conputed using the following formula: if age month is greater than six, age equals age year plus one; if age month is less than six, age equals age year.

For each test item, the mean, median, range, standard deviation and standard error of measurement are reported. The individual test items are reported in terms of the mean score for each age group by sex and the mean scores are discussed as they relate to the raw score values.

On later tables, and in discussions, the items on the Bruininks-Oseretsky Test will be grouped according to Gross Motor, Combined Gross and Fine Motor, and Fine Motor test items. Each item within the group will be discussed separately and then collectively in the summary.

Table 2 represents the Results by Combined Grade Data for the AAHPERD Test. Items 19-22 relate to the raw scores for

TABLE 1. RESULTS BY COMBINED GRADE DATA FOR THE BRUININKS-OSERETSKY POINT SCORE
(N = 323 children; Grades K-3; 47% Females, 53% Males)

ITEM	M	Mdn	R	S_d	S_{ERROR}
1) RSPD	5.464	6.000	11.000	2.225	.124
2) BAL7	1.925	1.000	6.000	1.302	.073
3) BAL2	4.249	4.000	5.000	1.798	.100
4) BILAT6	1.847	2.000	4.000	.757	.042
5) BILAT1	.872	1.000	1.000	.334	.019
6) STRENGTH	6.065	6.000	11.000	1.979	.110
7) UPLIMB5	1.745	2.000	3.000	.744	.042
8) UPLIMB3	2.040	2.000	5.000	.933	.052
9) RESPEED	6.338	5.000	17.000	3.620	.202
10) VISMOT8	.794	1.000	2.000	.532	.030
11) VISMOT5	1.000	1.000	2.000	.354	.020
12) VISMOT3	2.741	3.000	4.000	1.042	.058
13) UPLMSP7	4.025	4.000	7.000	1.512	.084
14) UPLMSP3	3.757	4.000	8.000	1.382	.077
BRUININKS-OSERETSKY COMPOSITE SCORES					
15) PTSCORE	42.728	42.000	62.000	11.152	.623
16) STDSCORE	44.744	45.000	51.000	11.132	.622
17) PCTSCORE	36.538	31.000	98.000	29.328	1.640
18) STANINE	4.025	4.000	8.000	2.087	.117

TABLE 2. RESULTS BY COMBINED GRADE DATA FOR THE AAHPERD TEST

ITEM	M	Mdn	R	S_d	S_{ERROR}
19) SKINFOLD *	20.651	19.000	54.000	8.138	.461
(PERCENTILE)	26.138	20.000	85.000	19.365	1.096
20) SIT & REACH	26.804	27.000	22.000	3.936	.223
(PERCENTILE)	54.635	60.000	94.000	23.822	1.349
21) SIT-UPS	22.340	22.000	48.000	8.827	.502
(PERCENTILE)	33.502	25.000	95.000	23.858	1.357
22) 9-MINUTE RUN	1356.477	1347.500	1295.000	199.944	11.506
(PERCENTILE)	41.175	40.000	85.000	21.759	1.252

* Results obtained over their clothes.

the AAHPERD Test and items 23-26 relate to the percentile scores for the AAHPERD Test. The AAHPERD Test employs the use of the variables of age and sex to determine percentile scores for each test item. The age variable was computed using age year only.

In reporting the school-wide results for Green Grove the data from Table 1 and Table 2 were discussed with the teachers. For example, considering all of the children at Green Grove School the mean percentile rank of 36.538 (item 17) was within the average range for the Bruininks-Oseretsky Test of Motor Proficiency. An illustration of the relationship of composite or Short Form standard scores to percentile ranks and stanines is included in Appendix I . "Average" by this illustration is from 23-76 points. The overall results of the children's performance on the AAHPERD Test were also explained; these data reveal that in two areas, Sit-ups and 9-Minute Run percentiles were below the fiftieth percentile, and improvement in these areas would be indicated.

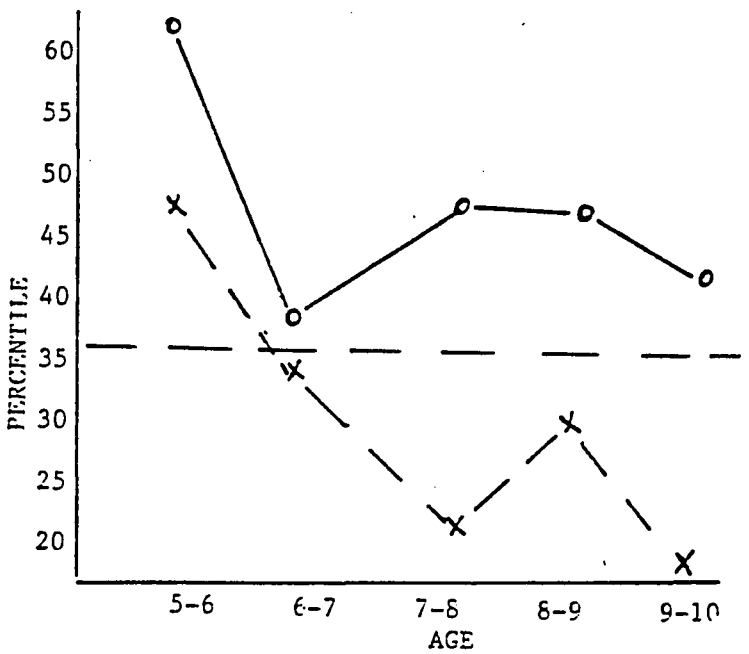
A more detailed analysis is presented in the later Tables. Table 3 represents the Age and Sex Distributions of the research group. The school population equaled 323. The highest number of missing cases for any test item equaled nine which was less than 3% of all subjects on any one test item.

TABLE 3. AGE DISTRIBUTIONS BY SEX

5 & 6 year olds = 32	F= 17	1 = 5 yrs	16 = 6 yrs
	M= 15		15 = 6 yrs
6 & 7 year olds = 72	F = 37	19 = 6 yrs	18 = 7 yrs
	M = 35	16 = 6 yrs	19 = 7 yrs
7 & 8 year olds = 81	F = 42	20 = 7 yrs	22 = 8 yrs
	M = 39	16 = 7 yrs	23 = 8 yrs
8 & 9 year olds = 78	F = 31	12 = 8 yrs	19 = 9 yrs
	M = 47	25 = 8 yrs	22 = 9 yrs
9 & 10 year olds = 51	F = 23	16 = 9 yrs	7 = 10 yrs
	M = 28	15 = 9 yrs	13 = 10 yrs

Figure 1 represents the Percentile Ranks for the Bruininks-Oseretsky Test for each group by age and sex. Figures 2-5 present the Percentile Ranking for the AAHPERD Subtests according to age and sex. The individual age groups for males and females are charted in reference to the overall group percentile rank. The males' average scores were always above the group average and the females' scores were above the group average until the 7-and 8-year old set after which the scores declined for the older girls.

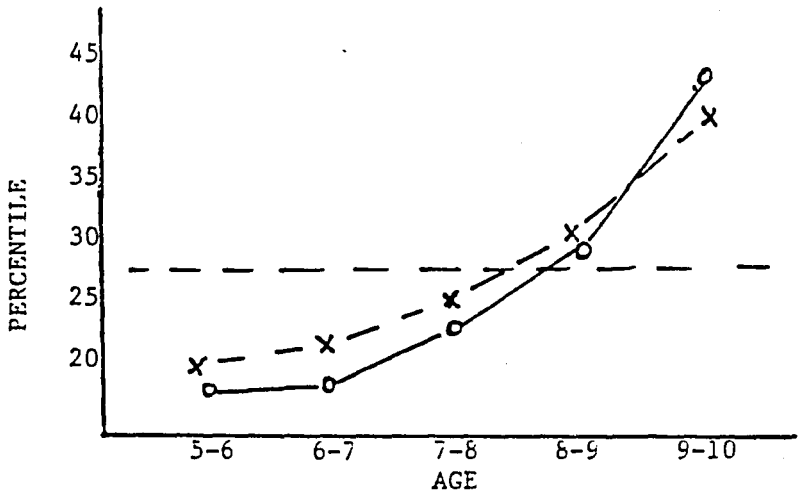
The AAHPERD Test results from Figures 2-5 revealed the following patterns. (1) The skinfold percentile scores (Figure 2) increased with age for both males and females. Both males and females above the 7-and 8-year old level scored higher than the combined percentile mean. (2) The males scored higher than the females at each age level on the Sit and Reach Test (Figure 4). They tended to be above the combined group mean percentile, whereas the females tended to be below that mean. This would seem to indicate that the males tended to have more lower-back flexibility than the females. (3) The males' score in Sit-ups (Figure 3) tended to increase with age and the females' scores decreased with age. This would suggest that the males had greater abdominal strength and endurance than the females in these age groups. (4) All student percentile scores both male and female decreased with age for this group of children.



X = FEMALE O = MALE

Group Mean Score = 36.5

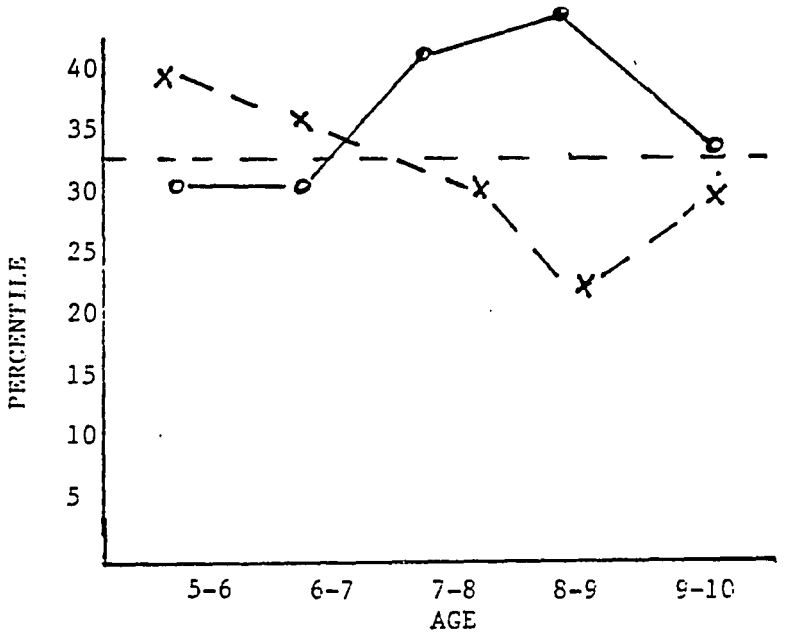
Figure 1. Bruininks-Oseretsky Results by Age and Sex



X = FEMALE 0 = MALE GROUP MEAN SCORE = 26.138

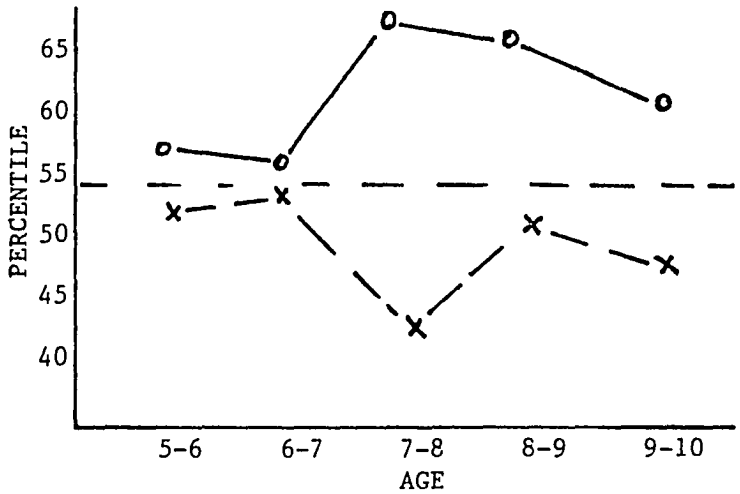
*Results obtained over their clothes.

Figure 2. Skinfold



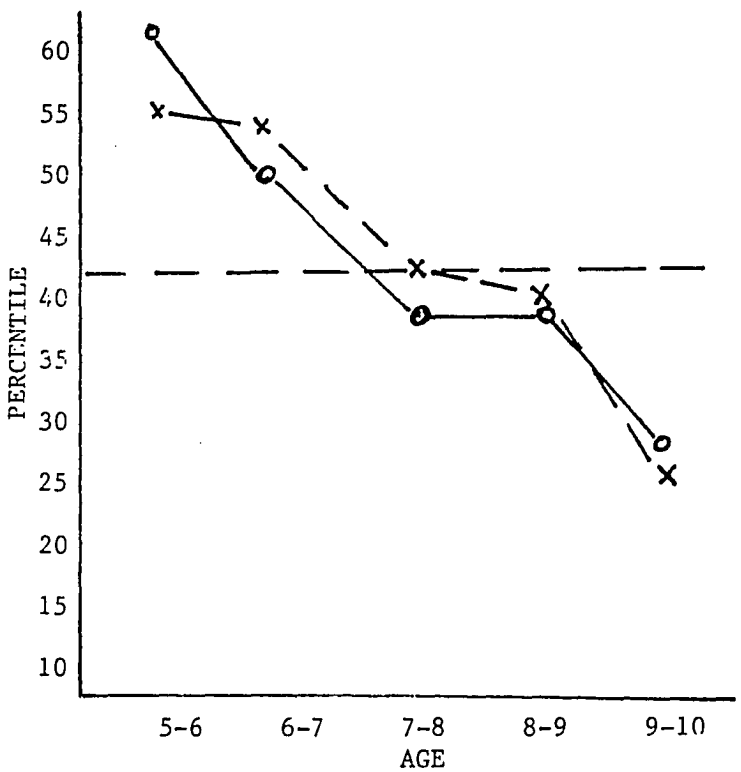
X = FEMALE 0 = MALE GROUP MEAN SCORE = 33.5

Figure 3. Sit-Ups



X = FEMALE 0 = MALE GROUP MEAN SCORE = 54.635

Figure 4. Sit & Reach



X = FEMALE 0 = MALE GROUP MEAN SCOPE = 41.175

Figure 5. 9-Minute Run

The implications of these findings would suggest that these children need regular, high levels of exercise to improve abdominal strength and endurance and cardiorespiratory endurance.

The group data for the AAHPERD Test confirmed the findings reported by Ross, Dotson, Gilbert, and Katz (1985) which indicate that boys 10 years and older can do more sit-ups and stretch farther, and that the distance events tend to taper off for both the girls and boys as age increases.

In the context of elementary physical education in the district, it is tempting to ask if the fitness scores reveal a lack of motor experience or absence of planned physical activity.

Table 4 represents the Results of the items of the Bruininks-Oseretsky Test by Age and Sex. Each item is discussed in reference to the mean scores obtained from the raw scores.

The group data for the Green Grove children are similar to the findings of Broadhead and Bruininks (1982) which indicated that the motor performance traits on the short form of children 5 through 14 years of age would show a markedly linear increasing mean performance curve for both boys and girls on all the 14 test items. For Green Grove School the total points increased with age while there were some variations from this trend on specific items.

TABLE 4. RESULTS BY AGE AND SEX FOR THE BRUININKS-OSERETSKY POINT SCORES

AGE	SEX	ITEM	M	MDN	R	S_d	S_{ERROR}
5 & 6	F	1) RSPD	3.471	4.000	7.000	2.095	.508
	M		4.467	5.000	6.000	1.552	.401
6 & 7	F		3.972	4.000	8.000	2.091	.348
	M		4.857	5.000	7.000	1.438	.243
7 & 8	F		4.024	4.000	8.000	2.236	.345
	M		6.231	6.000	7.000	1.662	.266
8 & 9	F		5.484	6.000	9.000	1.981	.356
	M		6.936	7.000	7.000	1.634	.238
9 & 10	F		5.870	6.000	4.000	1.290	.269
	M		7.571	8.000	9.000	1.814	.343
5 & 6	F	2) BAL7	1.647	1.000	4.000	1.272	.308
	M		1.667	1.000	5.000	1.345	.347
6 & 7	F		1.778	1.000	3.000	1.045	.174
	M		1.429	1.000	4.000	1.119	.189
7 & 8	F		1.857	1.000	3.000	1.181	.182
	M		1.821	1.000	4.000	1.295	.207
8 & 9	F		2.613	3.000	6.000	1.564	.281
	M		1.894	1.000	4.000	1.323	.193
9 & 10	F		2.043	2.000	3.000	1.261	.263
	M		2.429	2.500	4.000	1.399	.264

5 & 6	F	3) BAL2	3.882	4.000	5.000	1.867	.453
	M		3.933	4.000	5.000	1.710	.441
6 & 7	F		3.833	4.000	5.000	1.844	.307
	M		3.371	3.000	5.000	1.629	.275
7 & 8	F		4.690	6.000	5.000	1.774	.274
	M		3.949	4.000	5.000	1.905	.305
8 & 9	F		4.613	6.000	5.000	1.726	.310
	M		4.277	5.000	5.000	1.885	.275
9 & 10	F		4.957	6.000	4.000	1.461	.305
	M		4.857	6.000	4.000	1.533	.290
5 & 6	F	4) BILAT6	1.353	1.000	1.000	.493	.119
	M		1.600	2.000	1.000	.507	.131
6 & 7	F		1.500	1.000	3.000	.737	.123
	M		1.457	1.000	2.000	.611	.103
7 & 8	F		1.643	2.000	2.000	.656	.101
	M		2.000	2.000	4.000	.827	.132
8 & 9	F		2.032	2.000	2.000	.706	.127
	M		2.170	2.000	4.000	.761	.111
9 & 10	F		1.957	2.000	2.000	.638	.133
	M		2.429	2.000	3.000	.790	.149

5 & 6	F	5) BILAT1	.824	1.000	1.000	.393	.095
	M		.733	1.000	1.000	.458	.188
6 & 7	F		.917	1.000	1.000	.280	.047
	M		.914	1.000	1.000	.284	.048
7 & 8	F		.905	1.000	1.000	.297	.046
	M		.821	1.000	2.000	.451	.072
8 & 9	F		.935	1.000	1.000	.250	.045
	M		.851	1.000	1.000	.360	.052
9 & 10	F		.870	1.000	1.000	.344	.072
	M		.893	1.000	1.000	.315	.060
5 & 6	F	6) STRENGTH	4.118	4.000	5.000	1.269	.308
	M		4.933	5.000	2.000	.704	.182
6 & 7	F		4.639	4.500	8.000	1.641	.274
	M		5.371	5.000	6.000	1.308	.221
7 & 8	F		4.857	4.500	6.000	1.676	.259
	M		6.692	6.000	9.000	1.880	.301
8 & 9	F		6.226	6.000	7.000	1.783	.320
	M		7.468	8.000	8.000	1.692	.247
9 & 10	F		6.739	7.000	4.000	1.096	.229
	M		8.107	8.000	7.000	1.595	.301

5 & 6	F	7) UPLIMB5	1.175	1.000	2.000	.636	.154
	M		1.533	1.000	2.000	.640	.165
6 & 7	F		1.361	1.000	1.000	.487	.081
	M		1.486	1.000	3.000	.658	.111
7 & 8	F		1.381	1.000	3.000	.697	.108
	M		2.051	2.000	3.000	.724	.116
8 & 9	F		1.839	2.000	3.000	.779	.140
	M		2.170	2.000	2.000	.601	.088
9 & 10	F		1.609	2.000	3.000	.783	.163
	M		2.179	2.000	2.000	.548	.104
5 & 6	F	8) UPLIMB3	1.294	1.000	3.000	.849	.206
	M		2.000	2.000	2.000	.845	.218
6 & 7	F		1.333	1.000	5.000	1.014	.169
	M		1.743	2.000	3.000	.950	.161
7 & 8	F		1.786	2.000	4.000	.976	.151
	M		2.128	2.000	3.000	.894	.143
8 & 9	F		2.290	2.000	2.000	.793	.124
	M		2.489	3.000	4.000	.748	.109
9 & 10	F		2.348	2.000	2.000	.647	.135
	M		2.571	3.000	2.000	.634	.120

5 & 6	F	9) RESPEED	3.000	3.000	7.000	1.696	.411
	M		5.267	4.000	8.000	2.815	.727
6 & 7	F		4.778	5.000	10.000	2.416	.403
	M		4.886	4.000	14.000	2.878	.486
7 & 8	F		5.619	5.000	16.000	3.123	.482
	M		7.385	6.000	17.000	4.017	.643
8 & 9	F		6.161	6.000	11.000	2.734	.491
	M		8.532	8.000	17.00	3.878	.566
9 & 10	F		5.957	6.000	9.000	2.402	.501
	M		9.036	8.000	16.000	4.501	.851
5 & 6	F	10) VISMOT8	.294	.000	1.000	.470	.114
	M		.400	.000	1.000	.507	.131
6 & 7	F		.583	1.000	1.000	.500	.083
	M		.486	.000	1.000	.507	.086
7 & 8	F		.762	1.000	2.000	.532	.082
	M		.872	1.000	2.000	.409	.066
8 & 9	F		.968	1.000	2.000	.547	.098
	M		.936	1.000	2.000	.385	.056
9 & 10	F		1.000	1.000	2.000	.426	.089
	M		1.214	1.000	2.000	.499	.094

5 & 6	F	11) VISMOT5	1.000	1.000	2.000	.354	.086
	M		.867	1.000	1.000	.352	.091
6 & 7	F		.944	1.000	1.000	.232	.039
	M		.943	1.000	2.000	.416	.070
7 & 8	F		1.024	1.000	2.000	.269	.042
	M		1.000	1.000	2.000	.324	.052
8 & 9	F		1.032	1.000	2.000	.407	.073
	M		.979	1.000	2.000	.329	.048
9 & 10	F		1.087	1.000	1.000	.288	.060
	M		1.107	1.000	2.000	.567	.107
5 & 6	F	12) VISMOT3	2.471	2.000	2.000	.717	.174
	M		2.133	2.000	3.000	.743	.192
6 & 7	F		2.500	2.000	4.000	.971	.162
	M		2.200	2.000	4.000	.933	.158
7 & 8	F		2.524	3.000	4.000	1.153	.178
	M		2.872	3.000	3.000	.923	.148
8 & 9	F		2.968	3.000	4.000	1.140	.205
	M		2.979	3.000	3.000	.967	.141
9 & 10	F		3.348	4.000	2.000	.775	.162
	M		3.250	4.000	4.000	1.076	.203

5 & 6	F	13) UPLMSP7	3.412	3.000	4.000	1.064	.258
	M		2.933	3.000	4.000	1.100	.284
6 & 7	F		3.444	3.000	6.000	1.594	.266
	M		3.000	3.000	6.000	1.213	.205
7 & 8	F		3.833	4.000	7.000	1.305	.201
	M		3.769	4.000	5.000	1.307	.209
8 & 9	F		4.548	5.000	6.000	1.690	.304
	M		4.298	4.000	5.000	1.250	.182
9 & 10	F		5.348	5.000	3.000	.935	.195
	M		5.036	5.000	7.000	1.453	.274
5 & 6	F	14) UPLMSP3	3.176	3.000	4.000	1.286	.312
	M		2.000	2.000	3.000	.926	.239
6 & 7	F		3.278	3.000	6.000	1.233	.206
	M		2.914	3.000	7.000	1.222	.206
7 & 8	F		3.738	4.000	3.000	.912	.141
	M		3.538	3.000	7.000	1.253	.201
8 & 9	F		4.677	5.000	6.000	1.326	.238
	M		3.979	4.000	5.000	1.151	.168
9 & 10	F		5.217	5.000	4.000	1.380	.288
	M		4.286	4.000	5.000	1.213	.229

COMPOSITE SCORES FOR THE BRUININKS-OSERETSKY TEST

5 & 6	F	15) PTSCORE	31.059	31.000	19.000	5.471	1.327
	M		34.467	34.000	19.000	5.303	1.369
6 & 7	F		34.861	34.500	40.000	8.942	1.490
	M		35.086	34.000	37.000	7.747	1.310
7 & 8	F		38.024	37.000	33.000	8.383	1.293
	M		45.128	45.000	48.000	9.796	1.569
8 & 9	F		46.516	46.000	33.000	8.771	1.575
	M		50.170	51.000	40.000	8.825	1.287
9 & 10	F		47.957	47.000	24.000	6.442	1.343
	M		54.607	56.000	59.000	11.328	2.141
5 & 6	F	16) STDSCORE	49.765	49.000	25.000	7.412	1.798
	M		53.800	53.000	25.000	7.053	1.821
6 & 7	F		45.444	45.500	45.000	10.478	1.746
	M		46.000	45.000	41.000	8.921	1.508
7 & 8	F		39.238	39.500	37.000	9.458	1.459
	M		48.385	50.000	51.000	11.269	1.804
8 & 9	F		41.839	41.000	39.000	10.755	1.932
	M		47.553	50.000	43.000	10.936	1.595
9 & 10	F		35.565	31.000	28.000	8.918	1.860
	M		45.786	47.000	51.000	13.231	2.500

5 & 6	F	17) PCTSCORE	48.176	46.000	78.000	25.437	6.169
	M		61.067	62.000	70.000	19.916	5.142
6 & 7	F		37.694	32.500	97.000	28.512	4.752
	M		37.657	31.000	92.000	25.775	4.357
7 & 8	F		22.238	15.000	85.000	22.389	3.455
	M		45.385	50.000	98.000	31.090	4.978
8 & 9	F		29.000	18.000	89.000	28.832	5.178
	M		45.255	50.000	94.000	30.631	4.468
9 & 10	F		14.652	3.000	57.000	19.047	3.972
	M		38.714	38.000	98.000	33.006	6.238
5 & 6	F	18) STANINE	4.941	5.000	5.000	1.391	.337
	M		6.000	6.000	5.000	1.414	.365
6 & 7	F		4.139	4.000	8.000	1.959	.326
	M		4.229	4.000	7.000	1.664	.281
7 & 8	F		2.952	3.000	6.000	1.738	.268
	M		4.692	5.000	8.000	2.154	.345
8 & 9	F		3.452	3.000	7.000	1.981	.356
	M		4.617	5.000	7.000	2.112	.308
9 & 10	F		2.217	1.000	4.000	1.565	.326
	M		4.179	4.000	8.000	2.358	.446

Bruininks-Oseretsky Test: Gross Motor Subtest

Test Item 1: Running Speed and Agility.

The lowest mean score (3.471) was reported for the 5-and 6-year-old females. This represented a raw score of 9.9 to 10.4 seconds. The highest mean score (7.571) was reported for 9-and 10-year-old males which equals a raw score of 7.5 to 7.8 seconds. The mean scores for both sexes increased with age. The males' scores were higher at each age level than the females' scores.

Test Item 2: Balance 7--Walking Heel-to-Toe on Balance Beam

The lowest mean score (1.429) was reported for 6-and 7-year-old males. This raw score equaled 1 to 3 steps. The highest mean score (2.613) was reported for 8-and 9-year-old females which equals a raw score of 4 steps. The females in the age groups of 6 through 9 years of age tended to score higher than their male counterparts. There were only slight differences between 5-and 6-year-old male and female scores and 9-and 10-year-old male and female scores. In these two groups the males scored higher than the females.

Test Item 3: Balance 2--Standing on Preferred Leg on Balance Beam

The lowest mean score (3.371) was reported for 6-and 7-year-old males. This represents a raw score of 6 to 8 seconds. The highest mean score (4.957) was reported for 9 -and 10-year-old

females which equals a raw score of 9 seconds. In all age groups, except the 5-and 6-year-old group, the females scored higher than the males.

Test Item 4: Bilateral Coordination 6--Jumping Up and Clapping Hands

The lowest mean score (1.353) was reported for 5-and 6-year-old females. This represents a raw score of 1 clap. The highest mean score (2.429) was reported for 9-and 10-year-old males which was equal to a raw score of 2 claps. The males tended to score higher than the females on this test item.

Test Item 5: Bilateral Coordination 1--Tapping Feet While Making Circles with Fingers

The lowest mean score (.733) was reported for 5-and 6-year-old males. This raw score represents a score less than passing. A passing score equaled 1. The highest mean score (.935) was reported for 8-and 9-year-old females which equaled passing. The item was recorded as pass or fail. The females tended to score higher than the males on this test item. The scores for both females and males increased with age for each age group.

Test Item 6: Strength--Standing Broad Jump

The lowest mean score (4.118) was reported for 5-and 6-year-old females. This represents a raw score of 4. The highest mean score (8.107) was reported for 9-and 10-year-old males for a raw score of 8. The males scored higher than the females and the scores increased with age.

Bruininks-Oseretsky Test: Combined Gross and Fine Motor Subtest:

Test Item 7: Upper-Limb Coordination 5--Throwing a Ball at Target with Preferred Hand

The lowest mean score (1.381) was reported for 7-and 8-year- old females. This represents a raw score of 1 to 2 hits. The highest mean score (2.179) was reported for 9-and 10-year-old males which equals a raw score of 3 to 4 hits. The females' raw score tended to vary up and down with age groups while the males' mean scores increased with age.

Test Item 8: Upper-Limb Coordination 3--Catching a Tossed Ball with Both Hands

The lowest mean score (1.294) was reported for 5-and 6-year-old females. This raw score equaled 1 to 2 catches. The highest mean score (2.517) was reported for 9-and 10-year-old males which was a raw score equaled to 3 to 4 catches. Both females' and males' mean scores increased with age. The males scored higher than their female counterparts.

Bruininks-Oseretsky Test: Fine Motor Subtest

Test Item 9: Response Speed

The lowest mean score (3.000) was reported for 5-and 6-year-old females. This raw score equivalent equaled 3. The highest mean score (9.036) was reported for 9-and 10-year-old males which was equal to a raw score of 9. The females' scores increased with age until age 9-and 10-years. The males' scores showed an increase with age.

Test Item 10: Visual-Motor Control 8--Copying Overlapping Pencils with Preferred Hand

The lowest mean score (.294) was reported for 5-and 6-year-old females. The raw score equaled 0. The highest mean score (1.214) was reported for 9-and 10-year-old males from a raw score of 1. All mean scores increased with age.

Test Item 11: Visual-Motor Control 5--Copying A Circle with Preferred Hand

The lowest mean score (.867) was reported for 5-and 6-year-old males. The raw score equaled less than 1. The highest mean score (1.087) was reported for 9-and 10-year-old females from a raw score of 1. The females' scores were higher than their male counterparts. All scores increased with age.

Test Item 12: Visual-Motor Control 3--Drawing a Line Through a Straight Path with Preferred Hand

The lowest mean score (2.133) was reported for 5-and 6-year-old males for a raw score of 2 to 5 errors. The highest mean score (3.348) was reported for 9-and 10-year-old females for a raw score equaled to 1. The females tended to score higher than the males. The females' scores increased with age. The males' scores decreased with age.

Test Item 13: Upper-Limb Speed and Dexterity 7--Making Dots in Circles with Preferred Hand

The lowest mean score (2.933) was reported for 5-and 6-year- old males from a raw score of 11 to 15 dots. The highest mean score (5.348) was reported for 9-and 10-year-old females

which was a raw score of 26 to 30 dots. All mean scores increased with age. The females in each age group scored higher than the males on this test item.

Test Item 14: Upper-Limb Speed and Dexiterity 3--Sorting Shape Cards with Preferred Hand

The lowest mean score (2.000) was reported for 5-and 6-year-old males from a raw score of 9 to 12 cards. The highest mean score (5.217) was reported for 9-and 10-year-old females which was a raw score of 21 to 25 cards. The females scored higher than the males in all age groups.

Percentile Rank for the Bruininks-Oseretsky Test by Age

The lowest mean score (14.652) was reported for the 9-and 10-year-old females which was a total point score value of 35.565. The highest mean score (61.067) was reported for 5-and 6-year old males from a total point score value of 34.467. The percentile mean scores for the females decreased to age 8 and 9. The 8-and 9-year-old females' mean score increased, however the 9 and 10 year old female group mean scores declined. The males' mean score declined at the 6-and 7-year-old level, remained constant at the 7-through 9-year old levels, and declined at the 9-and 10-year old level.

These findings did not support those reported by Broadhead and Bruininks (1982), which indicated that over the span of 5 through 14 years of age, using analysis of trend, the mean performance curves for both boys and girls show a linear

increase for all the 14 test items. Only 11 out of 14 test items showed an increase in the mean performance for this group of children. Increases in performance were not found for the two Balance Subtests, and Bilateral Coordination 6.

Results of the AAHPERD Health-Related Fitness Test by Age and Sex

Table 5 represents the data obtained from the AAHPERD Test and analyzed by age and sex. The following results were found.

Test Item 19: Skinfold Measurement (mm)

The lowest mean score (17.519) was reported for 9-and 10-year-old males and the highest mean score (27.600) was reported for the 8-and 9-year-old females. The lowest mean precentile score of (13.333) was reported for 5-and 6-year-old males and the highest mean score of (41.481) was reported for 9-and 10-year-old males. The females in all age groups except 8-and 9- and 9-and 10-year-olds tended to have higher scores than the males within their age groups. The females and males in the 9 & 10 year old age group tended to have higher scores than the other children in the study.

Test Item 20: Sit and Reach Test (cm)

The lowest mean score (25.850 cm) was reported for the 7- and 8-year-old females and the highest mean score (27.769 cm) was reported for the 7-and 8-year-old males. The lowest percentile

TABLE 5.

RESULTS BY AGE AND SEX FOR THE AAHPERD TEST

AGE	SEX	ITEM *	M	Mdn	R	S_d	S_{ERROR}
		SKINFOLD (RAW)					
5 & 6	F		22.706	19.000	41.000	9.636	2.337
	M		19.867	17.000	29.000	7.328	1.892
6 & 7	F		21.971	20.000	36.000	7.583	1.282
	M		18.206	18.000	14.000	3.102	.532
7 & 8	F		22.075	19.500	29.000	6.482	1.025
	M		19.000	17.000	28.000	5.853	.937
8 & 9	F		27.600	22.000	52.000	13.969	2.550
	M		17.867	16.000	47.000	6.910	1.030
9 & 10	F		21.455	20.500	23.000	6.390	1.362
	M		17.519	16.000	37.000	7.234	1.392
		* SKINFOLD (PERCENTILE)					
5 & 6	F		17.647	15.000	55.000	14.265	3.460
	M		13.333	15.000	20.000	7.237	1.869
6 & 7	F		21.571	20.000	55.000	15.184	2.567
	M		13.676	10.000	30.000	7.619	1.307
7 & 8	F		26.000	22.500	70.000	17.402	2.751
	M		22.308	20.000	60.000	16.135	2.584
8 & 9	F		30.167	25.000	85.000	24.547	4.482
	M		30.333	30.000	65.000	16.216	2.417
9 & 10	F		40.000	42.500	70.000	23.094	4.924
	M		41.481	40.000	85.000	22.694	4.368

* Results obtained over their clothes.

SIT & REACH
(RAW)

5 & 6	F	26.824	28.000	15.000	4.231	1.026
	M	26.067	27.000	15.000	4.183	1.080
6 & 7	F	27.200	28.000	18.000	3.462	.585
	M	26.059	25.000	14.000	3.507	.601
7 & 8	F	25.850	25.500	16.000	3.592	.568
	M	27.769	28.000	17.000	4.504	.721
8 & 9	F	27.367	28.000	16.000	3.489	.637
	M	27.489	28.000	17.000	4.445	.663
9 & 10	F	26.636	26.500	11.000	3.094	.660
	M	26.704	26.000	16.000	4.065	.782

SIT & REACH
(PERCENTILE)

5 & 6	F	52.353	60.000	85.000	27.393	6.644
	M	57.000	65.000	80.000	23.964	6.188
6 & 7	F	53.571	55.000	80.000	20.954	3.542
	M	54.471	52.500	80.000	23.635	4.053
7 & 8	F	42.250	37.500	70.000	20.253	3.202
	M	65.385	75.000	85.000	25.965	4.158
8 & 9	F	50.667	55.000	85.000	19.464	3.554
	M	63.333	65.000	85.000	24.840	3.703
9 & 10	F	45.455	42.500	65.000	19.512	4.160
	M	59.222	60.000	84.000	22.664	4.362

SIT-UPS
(RAW)

5 & 6	F	18.375	17.500	20.000	5.976	1.494
	M	14.667	15.000	24.000	6.863	1.772
6 & 7	F	18.600	20.000	34.000	7.566	1.279
	M	16.912	17.000	29.000	8.039	1.379
7 & 8	F	21.300	22.000	32.000	6.342	1.003
	M	26.282	24.000	34.000	9.487	1.519
8 & 9	F	19.464	19.000	45.000	7.667	1.449
	M	28.622	30.000	45.000	8.161	1.217
9 & 10	F	45.455	42.500	65.000	19.512	4.160
	M	59.222	60.000	84.000	22.664	4.362

SIT-UPS
(PERCENTILE)

5 & 6	F	39.688	35.000	75.000	22.096	5.524
	M	31.333	25.000	70.000	22.557	5.824
6 & 7	F	34.686	30.000	95.000	21.813	3.687
	M	31.324	25.000	70.000	23.071	3.957
7 & 8	F	29.625	25.000	75.000	18.271	2.889
	M	41.744	35.000	90.000	29.301	4.692
8 & 9	F	19.643	17.500	95.000	18.556	3.507
	M	42.000	40.000	90.000	26.913	4.012
9 & 10	F	28.182	25.000	60.000	15.927	3.396
	M	32.037	25.000	85.000	24.894	4.791

9-MINUTE RUN
(RAW)

5 & 6	F	1239.333	1231.000	407.000	94.089	24.292
	M	1379.267	1357.000	559.000	138.382	35.730
6 & 7	F	1310.647	1302.000	876.000	179.541	30.791
	M	1342.970	1356.000	762.000	151.550	26.382
7 & 8	F	1282.974	1291.000	1083.000	185.606	29.721
	M	1400.316	1412.500	697.000	163.815	26.574
8 & 9	F	1341.679	1299.000	476.000	139.630	26.388
	M	1468.114	1469.500	852.000	237.009	35.730
9 & 10	F	1221.636	1215.000	860.000	182.324	38.872
	M	1450.111	1487.000	991.000	251.373	48.377

9-MINUTE RUN
(PERCENTILE)

5 & 6	F	55.333	55.000	45.000	12.022	3.104
	M	62.667	60.000	60.000	17.099	4.415
6 & 7	F	53.824	60.000	75.000	20.452	3.507
	M	47.273	50.000	85.000	20.198	3.516
7 & 8	F	41.154	40.000	80.000	19.482	3.120
	M	35.395	35.000	65.000	16.660	2.702
8 & 9	F	39.107	32.500	65.000	18.661	3.527
	M	35.455	35.000	80.000	23.890	3.602
9 & 10	F	25.000	20.000	75.000	18.961	4.043
	M	32.037	25.000	80.000	22.199	4.272

mean score (42.250) was reported for 7-and 8-year-old females. The highest mean score (65.385) was reported for 7-and 8-year-old males. The males scored higher than the females at each age level which would indicate that the males are more flexible than the females at Green Grove School. The result is congruent with the findings of Ross, Dotson, Gilbert, and Katz (1985) who studied children 10 years and older. However, the finding disagrees with Milne, Seefeldt, and Reuschlein (1976) who reported that females had better performance scores on flexibility in grades K-2. Since Hyde (1975) found no significant differences between kindergarten males and females on this variable, there does not seem to be a clear answer for this question.

Test Item 21: Sit-ups

The lowest mean score (14.667) was reported for 5-and 6-year-old males and the highest mean score (59.222) was reported for 9 & 10 year old males. The lowest percentile mean score (19.643) was reported for the 8-and 9-year-old females and the highest percentile mean score (42.000) was reported for 8-and 9-year-old males. Females 5 through 7 years of age scored higher than their male counterparts. Males 7 through 10 years of age scored higher than their female counterparts. All of the children in the study scored below the 50th percentile. This would indicate a definite need to encourage them to improve their abdominal strength and endurance through providing opportunities

for participating in organized activities. The finding was congruent with the idea that males would be expected to perform better than females as reported by Ross, Dotson, Gilbert, and Katz (1985), and Milne, Seefeldt, Reuschlein (1976) .

Test Item 22: 9-Minute Run (Yards)

The lowest mean score (1221.636 yds) was reported for the 9-and 10-year-old females and the highest mean score (1468.144 yds) was reported for 8-and 9-year-old males. The lowest percentile mean score (25.00) was reported for the 9-and 10-year-old females and the highest percentile mean score (62.667) was reported for the 5 & 6 year old males. All percentile mean scores decreased with age which was like the recent findings of Ross, Dotson, Gilbert, and Katz (1985) with children over 10 in that performance on distance events tended to decrease with age. However, the present national results do not explain why the decline might also be seen in K-3 children's performance.

Table 6 presents the results by sex alone for the Bruininks-Oseretsky Test. These data will be discussed in reference to how the females and males compared to each other on each of the subtest items.

Gross Motor Subtest

Running Speed and Agility.

The males' mean score (6.276) was considerably higher than the females' mean score (4.533). This would indicate that

TABLE 6. RESULTS BY SEX FOR THE BRUININKS-OSERETSKY TEST POINT SCORE

TEST ITEM	M	Mdn	R	S_d	S_{ERROR}
1) RSPD					
(FEMALES)	4.533	5.000	11.000	2.157	.176
(MALES)	6.276	6.000	10.000	1.955.	.150
2) BAL7					
(FEMALES)	1.993	1.000	6.000	1.288	.105
(MALES)	1.853	1.000	5.000	1.308	.100
3) BAL2					
(FEMALES)	4.427	5.000	5.000	1.777	.145
(MALES)	4.100	4.000	5.000	1.809	.139
4) BILAT6					
(FEMALES)	1.707	2.000	3.000	.700	.057
(MALES)	1.971	2.000	4.000	.788	.060
5) BILAT1					
(FEMALES)	.900	1.000	1.000	.301	.025
(MALES)	.847	1.000	1.000	.361	.028
6) STRENGTH					
(FEMALES)	5.300	5.000	9.000	1.794	.146
(MALES)	6.741	6.000	10.000	1.898	.146
7) UPLIMB5					
(FEMALES)	1.487	1.000	3.000	.702	.057
(MALES)	1.965	2.000	3.000	.704	.054
8) UPLIMB3					
(FEMALES)	1.813	2.000	5.000	.958	.078
(MALES)	2.235	2.000	5.000	.865	.066
9) RESPEED					
(FEMALES)	5.267	5.000	16.000	2.770	.226
(MALES)	7.302	7.000	17.000	4.010	.308
10) VISMOT8					
(FEMALES)	.747	1.000	2.000	.546	.045
(MALES)	.835	1.000	2.000	.518	.040

11) VISMOT5					
(FEMALES)	1.013	1.000	2.000	.306	.025
(MALES)	.988	1.000	2.000	.392	.030
12) VISMOT3					
(FEMALES)	2.740	3.000	4.000	1.052	.081
(MALES)	2.735	3.000	4.000	1.035	.079
13) UPLMSP7					
(FEMALES)	4.093	4.000	7.000	1.552	.127
(MALES)	3.953	4.000	7.000	1.475	.113
14) UPLMSP3					
(FEMALES)	3.987	4.000	6.000	1.395	.114
(MALES)	3.547	3.000	8.000	1.341	.103

COMPOSITE SCORES FOR THE BRUININKS-OSERETSKY TEST

15) PTSCORE					
(FEMALES)	39.793	40.000	46.000	9.911	.809
(MALES)	45.290	45.000	62.000	11.594	.892
16) STDSCORE					
(FEMALES)	41.793	41.000	47.000	10.572	.863
(MALES)	47.361	48.000	51.000	11.023	.848
17) PCTSCORE					
(FEMALES)	28.980	18.000	97.000	27.008	2.205
(MALES)	43.278	42.000	98.000	29.823	2.294
18) STANINE					
(FEMALES)	3.440	3.000	8.000	1.951	.159
(MALES)	4.544	5.000	8.000	2.079	.160

the males were faster and more agile than the females in this study.

Balance Subtests: Walking Heel-to-Toe on Balance Beam and Standing on Preferred Leg on Balance Beam

The females scored higher than the males on both of the balance subtests. Their mean score of 1.993 on Balance #7 equaled a raw score of 1 to 3 steps and their mean score of 4.427 on Balance #2 equaled a raw score of 7 to 8 seconds.

Bilateral Coordination Subtest: Jumping Up & Clapping Hands and Tapping Feet Alternately While Making Circles with Fingers

The females scored higher (.900) on Tapping Feet Alternately While Making Circles with Fingers than the males (.847), but the males scored higher (1.971) than the females (1.707) on Jumping Up and Clapping Hands. Thus, there did not appear to be a clear distinction between males and females on coordination.

Strength: Standing Broad Jump

The males scored higher (6.741) than the females (5.300) on the standing broad jump. This would suggest that the males tended to be more powerful than the females in this study.

Combined Gross and Fine Motor Subtest

Upper-Limb Coordination Subtest: Throwing a Ball at a Target with Preferred Hand and Catching a Tossed Ball with Both Hands.

The males scored higher on both of the upper-limb coordination subtests. They scored an average of 3 to 4 hits at throwing a ball at a target and an average of 3 to 4 catches with both hands of a tossed ball.

Fine Motor Subtest

Response Speed: The males' mean score (7.302) was higher than the females' mean score (5.267). This would indicate that the males responded more quickly than the females.

Visual-Motor Control Subtest: (Perferred Hand) Copying Overlapping Pencils, Copying a Circle and Drawing a Line Through a Straight Path

The males scored slightly higher (.835) than the females (.747) on copying overlapping pencils while the females scored slightly higher (1.013 & 2.740) than the males (.988 & 2.735) on the other two items.

Upper-Limb Speed and Dexterity: Making Dots In Circles with Preferred Hand and Sorting Cards.

The females scored higher (4.093 & 3.987) on both of these tasks than the males (3.953 & 3.547).

Percentile Rank for the Bruininks-Oseretsky Test by Sex

The males scored higher (43.278) on the overall test battery than the females (28.980). Both groups scored within the average level for this test which ranges from 23-76 points.

Some of the findings reported by Bruininks (1978) which were supported by this study include the following: (1) For the four gross motor ability subtests the single item assessing strength, and that assessing running speed and agility, showed significant differences which favored the boys, while on the items assessing balance, and bilateral coordination #1 the isolated differences favored the girls. (2) For fine motor ability a single difference which favored the boys occurred on response speed,

while consistent differences favoring the girls were noted on both items assessing upper-limb speed and dexterity.

Sex differences were found on two of the three Visual-Motor Control Subtests in favor of the females. This finding is contrary to the finding reported by Bruininks (1978) in which it is stated that on none of the three items assessing the visual-motor control component of fine motor ability were sex differences within an age group noted.

Table 7 represents results by sex for the AAHPERD Test. In this comparison between sexes only the percentile scores will be discussed.

Skinfold Percentile Score

The females mean score (26.931) was higher than the males mean score (25.572).

Sit and Reach Percentile Score

The males' mean score (60.036) was much greater than the females' mean score (48.414). This would suggest that the males had more flexibility in the lower back and hamstrings than the females. Since the females scored below the 50th percentile, it was recommended that they be shown how to increase and maintain their flexibility and that all students have ample activity opportunities.

TABLE 7. RESULTS BY SEX FOR THE AAHPERD TEST

	M	Mdn	R	S_d	S_{ERROR}
19) SKINFOLD *					
(FEMALES)	23.207	20.000	52.000	9.267	.770
(MALES)	18.319	17.000	48.000	6.087	.472
(PERCENTILE)					
(FEMALES)	26.931	20.000	85.000	20.097	1.669
(MALES)	25.572	20.000	85.000	18.728	1.454
20) SIT AND REACH					
(FEMALES)	26.738	28.000	21.000	3.540	.294
(MALES)	26.849	27.000	21.000	4.269	.331
(PERCENTILE)					
(FEMALES)	48.414	50.000	90.000	21.243	1.764
(MALES)	60.036	62.500	94.000	24.744	1.920
21) SIT-UPS					
(FEMALES)	20.303	21.000	45.000	6.922	.581
(MALES)	24.133	24.000	47.000	9.862	.765
(PERCENTILE)					
(FEMALES)	29.641	25.000	95.000	20.124	1.689
(MALES)	36.976	30.000	95.000	26.202	2.034
22) 9-MINUTE RUN					
(FEMALES)	1285.583	1263.000	1139.000	170.288	14.444
(MALES)	1418.395	1420.000	1013.000	203.704	16.004
(PERCENTILE)					
(FEMALES)	42.590	40.000	85.000	21.233	1.801
(MALES)	40.093	40.00	85.000	22.204	1.744

* Results obtained over their clothes.

Sit-Ups Percentile Score

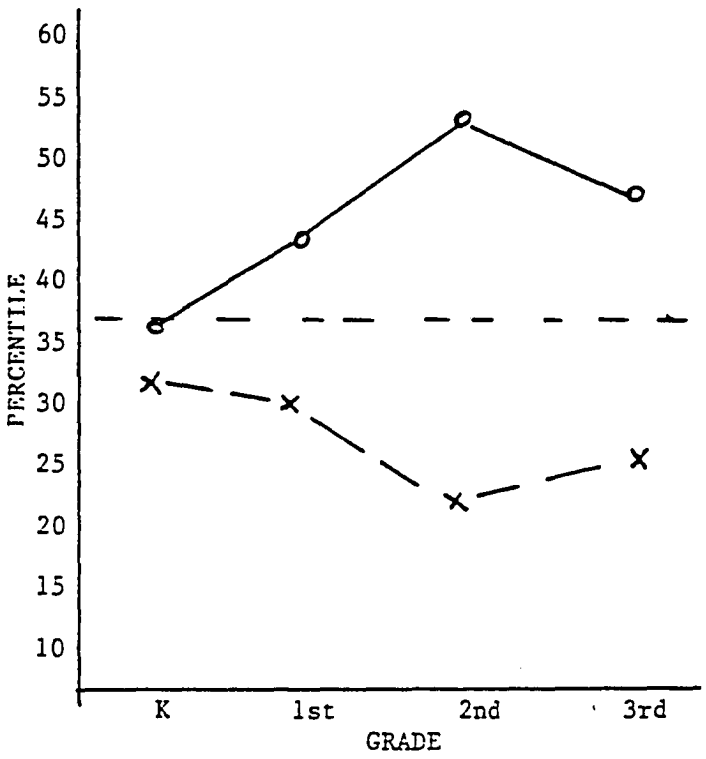
The males' mean score (36.976) was higher than the females' mean score (29.641). Since both the male and female groups scored below the 50th percentile, it was recommended that they be given opportunities to improve their abdominal strength and endurance along with low back, hip, and posterior thigh flexibility through planned activity.

9-Minute Run Percentile

The females' mean score (42.590) was higher than the males' mean score (40.093). Since both the female and male groups scored below the 50th percentile, these students should be encouraged through frequently structured opportunities to try to gradually increase their percentile ranking according to their age and sex as a minimum motivational level in cardiorespiratory function. Ross and others (1985) speculated that some children lacked motivation; therefore, their performance on distance events decreased with age.

Figure 6 presents the Results of the Bruininks-Oseretsky Test by Grade and Sex. Figures 7-10 present the Results of the AAHPERD Percentile Scores by Grade and Sex.

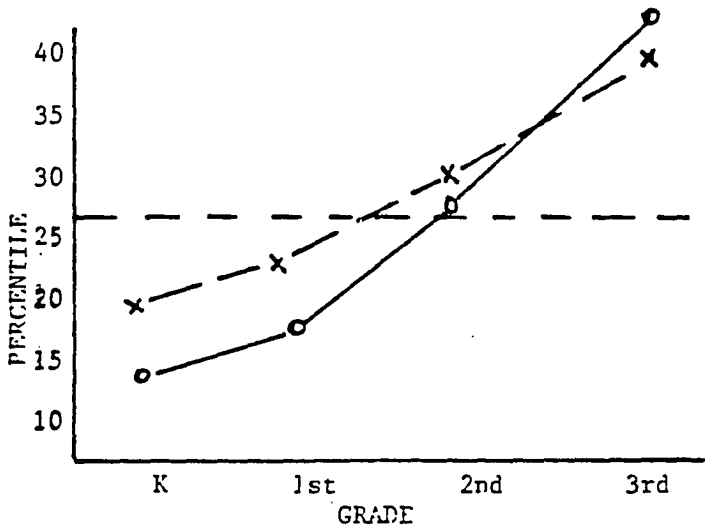
The group mean for the overall Bruininks-Oseretsky Test was 36.5. For all grade groups, K-3, the average score for males fell above the group mean and the average scores for females fell below the mean.



FEMALE = X 0 = MALE GROUP MEAN SCORE = 36.5

* The combined 2-3 class data was suppressed.

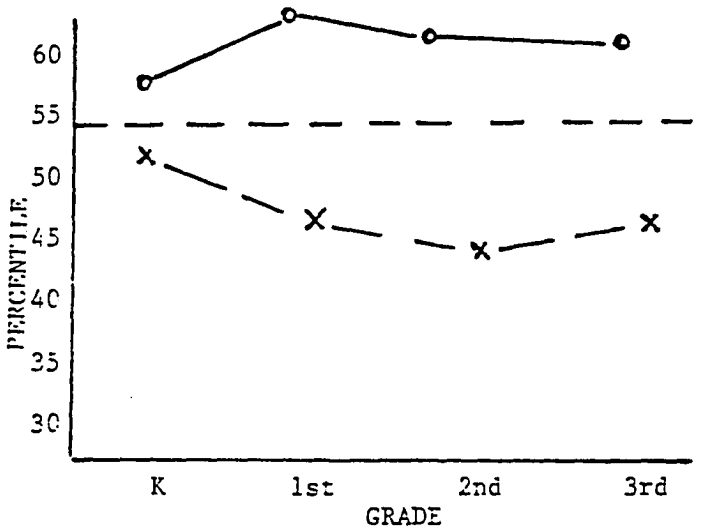
Figure 6. Bruininks-Oseretsky Test Results by Age and Sex



*Results obtained over their clothes.

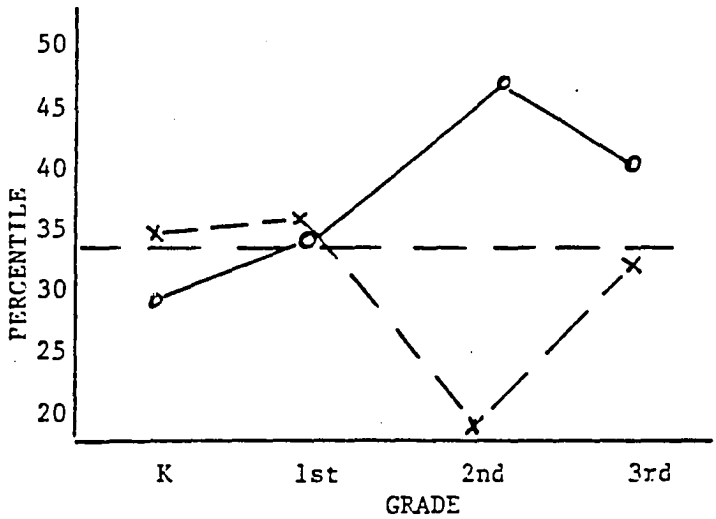
FEMALE = X 0 = MALE GROUP MEAN SCORE = 26.138

Figure 7. Skinfold



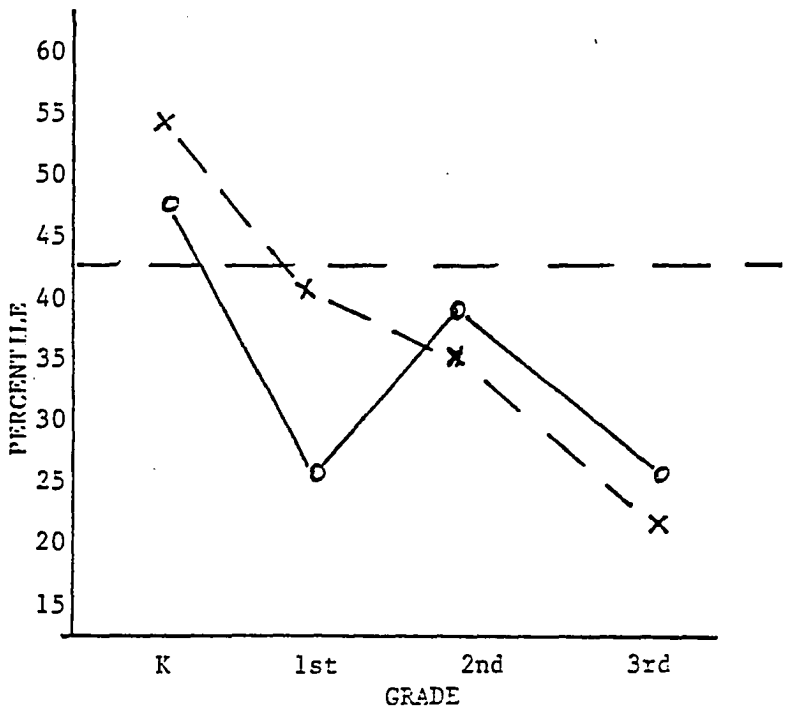
FEMALE = X MALE = 0 GROUP MEAN SCORE = 54.635

Figure 8. Sit & Reach



FEMALE = X MALE = 0 GROUP MEAN = 33.5

Figure 9. Sit-Ups



FEMALE = X MALE = 0 GROUP MEAN SCORE = 41.175

Figure 10. 9-Minute Run

The results of the percentile scores for the AAHPERD Test by grade and sex reveal some inconsistent patterns. (1) The males in all grade levels scored higher than the females on the Sit-and-Reach test (Figure 8). The females' scores tended to decrease with each grade level from K to 2nd grade and the males' scores tended to increase during this same time period. (2) The males' scores tended to peak at the 2nd grade level and then decline for the Sit-ups test (Figure 9), whereas the females' scores declined at the 3rd grade level. (3) The females' scores for the 9-Minute Run (Figure 10) were highest in kindergarten and decreased through the 3rd grade; the males' scores, though high at the kindergarten level, declined then peaked at the 2nd grade level and declined again at the 3rd grade level.

Table 8 represents the results for the Bruininks-Oseretsky Test by grade and sex. The results were discussed in reference to the subtests, and comparisons were made between the grades.

Gross Motor Subtest

Running speed and agility: The lowest mean score (3.267) was reported for the kindergarten females and the highest mean score (8.061) was reported for third grade males. The males

TABLE 8. RESULTS BY GRADE AND SEX FOR THE BRUININKS-OSERETSKY TEST (POINT SCORE)

GRADE	N	SEX	ITEM	M	MDN	R	S_d	S_{ERROR}
K	46	F	1) RSPD	3.267	3.000	7.000	2.016	.301
	44	M		4.591	5.000	6.000	1.468	.221
1ST	37	F		4.243	4.000	8.000	2.033	.334
		M		5.575	5.000	7.000	1.534	.243
2ND	31	F		5.000	5.000	8.000	1.862	.334
	40	M		6.925.	7.000	10.000	1.774	.281
3RD	30	F		6.100	6.000	9.000	1.749	.319
		M		8.061	8.000	4.000	.899	.157
2-3	7	F		5.429	6.000	3.000	1.397	.528
	31	M		7.615	8.000	4.000	1.387	.385
K		F	2) BAL7	1.556	1.000	4.000	1.013	.151
		M		1.409	1.000	4.000	1.085	.164
1ST		F		1.892	1.000	3.000	1.149	.189
		M		1.625	1.000	5.000	1.254	.198
2ND		F		2.516	2.000	5.000	1.503	.270
		M		2.175	1.000	4.000	1.412	.223
3RD		F		2.333	2.000	4.000	1.398	.255
		M		2.636	3.000	3.000	1.194	.208
2-3		F		1.571	1.000	3.000	1.134	.429
		M		1.077	1.000	4.000	.954	.265

K	F	3) BAL2	3.800	4.000	5.000	1.938	.289
	M		3.295	3.000	5.000	1.579	.238
1ST	F		1.892	1.000	3.000	1.149	.189
	M		1.625	1.000	5.000	1.254	.198
2ND	F		4.484	5.000	5.000	1.749	.314
	M		4.600	6.000	5.000	1.837	.290
3RD	F		5.067	6.000	4.000	1.413	.258
	M		4.758	6.000	4.000	1.562	.272
2-3	F		5.286	6.000	3.000	1.254	.474
	M		4.846	6.000	4.000	1.625	.451
K	F	4) BILAT6	1.356	1.000	2.000	.570	.085
	M		1.455	1.000	2.000	.548	.083
1ST	F		1.622	2.000	3.000	.721	.118
	M		1.625	2.000	3.000	.740	.117
2ND	F		1.935	2.000	2.000	.680	.122
	M		2.375	2.000	3.000	.628	.099
3RD	F		2.067	2.000	2.000	.640	.117
	M		2.455	2.000	3.000	.711	.124
2-3	F		1.857	2.000	2.000	.690	.261
	M		2.308	2.000	3.000	.751	.208

K	F	5) BILAT1	.844	1.000	1.000	.367	.055
	M		.795	1.000	1.000	.408	.062
1ST	F		.973	1.000	1.000	.164	.027
	M		.850	1.000	1.000	.362	.057
2ND	F		.871	1.000	1.000	.341	.061
	M		.900	1.000	1.000	.379	.060
3RD	F		.933	1.000	1.000	.254	.046
	M		.848	1.000	1.000	.364	.063
2-3	F		.857	1.000	1.000	.378	.143
	M		.923	1.000	1.000	.277	.077
K	F	6) STRENGTH	4.067	4.000	6.000	1.388	.207
	M		5.136	5.000	4.000	1.025	.155
1ST	F		4.865	5.000	7.000	1.437	.236
	M		5.925	6.000	8.000	1.542	.244
2ND	F		5.645	6.000	6.000	1.603	.288
	M		7.625	7.000	7.000	1.675	.265
3RD	F		7.033	7.000	5.000	1.351	.247
	M		8.121	8.000	5.000	1.431	.249
2-3	F		6.571	6.000	4.000	1.272	.481
	M		8.462	8.000	5.000	1.391	.386

K	F	7) UPLIMB5	1.200	1.000	2.000	.548	.082
	M		1.432	1.000	3.000	.625	.094
1ST	F		1.432	1.000	3.0000	.647	.106
	M		1.925	2.000	3.000	.730	.115
2ND	F		1.581	2.000	3.000	.720	.129
	M		2.250	2.000	2.000	.588	.093
3RD	F		1.867	2.000	3.000	.819	.150
	M		2.364	2.000	2.000	.549	.096
2-3	F		1.571	2.000	1.000	.535	.202
K	F	8) UPLIMB3	1.133	1.000	3.000	.815	.121
	M		1.818	2.000	3.000	.922	.139
1ST	F		1.811	2.000	5.000	.967	.159
	M		1.975	2.000	3.000	.920	.145
2ND	F		2.258	2.000	4.000	.855	.154
	M		2.475	3.000	4.000	.784	.124
3RD	F		2.233	2.000	2.000	.728	.133
	M		2.788	3.000	1.000	.415	.072
2-3	F		2.429	2.000	1.000	.535	.202
	M		2.308	2.000	2.000	.630	.175

K	F	9) RESPEED	3.756	4.000	10.000	2.123	.316
	M		4.773	4.000	10.000	2.420	.365
1ST	F		6.081	5.000	14.000	3.174	.522
	M		6.625	5.000	17.000	3.848	.608
2ND	F		5.419	5.000	10.000	2.172	.390
	M		8.925	8.500	16.000	3.765	.595
3RD	F		6.300	6.000	11.000	2.781	.508
	M		10.188	10.500	17.000	4.358	.770
2-3	F		5.571	5.000	8.000	3.047	1.152
	M		5.846	6.000	5.000	1.625	.451
K	F	10) VISMOT8	.422	0.000	1.000	.499	.074
	M		.445	0.000	1.000	.504	.076
1ST	F		.757	1.000	2.000	.597	.098
	M		.750	1.000	1.0000	.439	.069
2ND	F		.871	1.000	1.000	.341	.061
	M		1.025	1.000	2.000	.357	.056
3RD	F		1.033	1.000	2.000	.556	.102
	M		1.182	1.000	0.000	.000	.000
2-3	F		.923	1.000	2.000	.494	.137

K	F	11) VISMOT5	.933	1.000	2.000	.330	.049
	M		.909	1.000	2.000	.362	.055
1ST	F		1.054	1.000	1.000	.229	.038
	M		.925	1.000	2.000	.417	.066
2ND	F		1.000	1.000	2.000	.258	.046
	M		1.050	1.000	1.000	.221	.035
3RD	F		1.133	1.000	1.000	.346	.063
	M		1.091	1.000	2.000	.579	.101
2-3	F		.857	1.000	1.000	.378	.143
	M		1.000	1.000	0.000	.000	.000
K	F	12) VISMOT3	2.400	2.000	4.000	.751	.112
	M		2.023	2.000	4.000	.731	.110
1ST	F		2.730	3.000	4.000	1.262	.207
	M		2.825	3.000	3.000	1.010	.160
2ND	F		2.677	3.000	4.000	1.107	.199
	M		3.050	3.000	4.0000	.986	.156
3RD	F		3.133	3.000	4.000	1.008	.164
	M		2.939	3.000	4.000	1.116	.194
2-3	F		3.571	4.000	1.000	.535	.202
	M		3.385	4.000	2.000	.768	.213

K	F	13) UPLMSP7	3.089	3.000	4.000	1.125	.168
	M		2.773	3.000	4.000	1.054	.159
1ST	F		4.027	4.000	7.000	1.590	.261
	M		3.500	3.500	6.000	1.132	.179
2ND	F		4.065	4.000	5.000	1.289	.232
	M		4.400	4.000	5.000	1.172	.185
3RD	F		5.433	5.500	4.000	1.251	.228
	M		5.182	5.000	6.000	1.402	.244
2-3	F		5.286	5.000	3.000	1.113	.421
	M		4.846	5.000	4.000	1.144	.317
K	F	14) UPLMSP3	3.000	3.000	4.000	1.066	.159
	M		2.636	3.000	7.000	1.203	.181
1ST	F		3.784	4.000	5.000	1.084	.178
	M		3.125	3.000	4.000	.911	.144
2ND	F		4.161	4.000	5.000	1.157	.208
	M		4.050	4.000	8.000	1.339	.212
3RD	F		5.333	5.500	4.000	1.295	.237
	M		4.364	4.000	6.000	1.168	.203
2-3	F		4.857	5.000	2.000	.690	.261
	M		4.308	4.000	3.000	1.032	.286

COMPOSITE SCORES FOR THE BRUININKS-OSERETSKY TEST

K	F 15) PTSCORE	30.844	31.000	25.000	5.854	.873
	M	33.523	33.500	31.000	5.724	.863
1ST	F	39.000	40.000	33.000	8.383	1.378
	M	41.025	40.000	33.000	4.908	1.250
2ND	F	42.581	42.000	26.000	7.089	1.273
	M	52.025	53.500	51.000	8.405	1.329
3RD	F	49.700	49.500	28.000	7.760	1.417
	M	56.563	58.000	41.000	9.048	1.599
2-3	F	46.714	44.000	15.000	5.707	2.157
	M	49.769	50.000	21.000	6.327	1.755
K	F 16) STDSCORE	43.822	45.000	40.000	9.595	1.430
	M	46.295	46.000	45.000	8.531	1.286
1ST	F	43.432	40.000	47.000	11.689	1.922
	M	44.000	44.000	44.000	11.293	1.786
2ND	F	39.742	39.000	32.000	8.767	1.575
	M	51.475	52.500	51.000	10.520	1.663
3RD	F	40.600	41.000	39.000	11.828	2.160
	M	48.719	52.000	50.000	13.658	2.414
2-3	F	34.286	31.000	28.000	8.826	3.336
	M	45.308	44.000	26.000	8.750	2.427

K	F	17) PCTRANK	33.444	31.000	91.000	25.355	3.780
	M		38.705	34.000	96.000	24.796	3.738
1ST	F		33.081	16.000	97.000	30.441	5.004
	M		43.200	27.000	95.000	30.071	4.755
2ND	F		22.484	14.000	71.000	22.155	3.979
	M		55.550	60.000	98.000	27.701	4.380
3RD	F		27.900	18.000	89.000	29.307	5.351
	M		48.156	58.000	98.000	34.951	6.178
2-3	F		12.000	3.000	57.000	20.526	7.758
	M		36.923	27.000	73.000	26.453	7.337
K	F	18) STANINE	3.822	4.000	7.000	1.749	.261
	M		4.364	4.000	8.000	1.699	.256
1ST	F		3.757	3.000	8.000	2.204	.362
	M		3.925	4.000	8.000	2.188	.341
2ND	F		3.032	3.000	5.000	1.602	.288
	M		5.350	5.500	8.000	1.889	.299
3RD	F		3.267	3.000	7.000	2.149	.392
	M		4.750	5.000	8.000	2.489	.440
2-3	F		1.857	1.000	4.000	1.464	.553
	M		4.077	4.000	5.000	1.754	.487

scored higher than the females at each grade level; however, all scores increased with each grade level.

Balance Subtest: Walking Heel-to-Toe and Standing on Balance Beam

The lowest mean score (1.077) was reported for the males in the combined 2-3 class for the task of walking heel-to-toe. The highest mean score (2.516) was reported for the second grade females. On the average females scored higher than the males except for the third grade males who scored higher than the third grade females.

For the balance task of standing on the balance beam, the lowest scores were reported for first grade males and females. The third grade females scored the highest mean score (5.067). The females tended to score higher than the males at all grade levels except for the second grade level where the second grade males scored higher than the second grade females.

Bilateral Coordination Subtest: Jumping Up & Clapping Hands and Tapping Feet while Making Circles with Fingers

The highest mean score (2.455) was reported for third grade males and the lowest mean score (1.356) was reported for kindergarten females. On the task of jumping up & clapping hands scores improved across all grade levels with the males scoring higher than the females at all of the grade levels.

For the task of tapping feet and making circles with the fingers, the females across all grade levels tended to score better than the males. This would suggest that more females were able to pass this task than were the males.

Strength: Standing Broad Jump

The scores for the standing broad jump improved across all grade levels. The males in each grade level scored higher than the females in their grade level. The highest mean score was reported for the males in the combined class.

Combined Gross and Fine Motor Subtest

Upper-Limb Coordination: Throwing a Ball At a Target and Catching a Tossed Ball with Both Hands

The males in each grade level were more successful in hitting a target with a ball. The scores for both males and females improved with grade level. The males in each grade level were also more successful in catching a tossed ball with both hands. Again the skill improved across grade levels for both males and females.

Fine Motor Subtest

Response Speed:

The males in each grade level were dominant in this task. There was a sharp increase in scores with the first grade males and females scoring higher than kindergarten or second grade children.

Visual-Motor Control Subtest: Copying Overlapping Pencils, Copying a Circle, and Drawing a Line Through A Straight Path with the Preferred Hand

The third graders were more successful at copying overlapping pencils and copying a circle. The performance level

of these tasks improved with grade levels. The second and third graders scored the highest on drawing a line through a straight path.

Upper-Limb Speed and Dexterity: Making Dots in Circles and Sorting Cards

The females tended to score higher on these two tasks than did the males at each grade level. The scores, however, did improve across the grade levels for both females and males.

Thus, the results from the Bruininks-Oseretsky Test tend to suggest that improved performance was related to grade level for this subject group perhaps even more than the relationship to chronological age, because with the exception of the two balance subtests and response speed, the performance levels improved with grade level.

Percentile Rank for the Bruininks-Oseretsky Test by Grade

The second grade males were the only group to score above the 50th percentile on the Bruininks-Oseretsky Test of Motor Proficiency Short Form. However, a percentile rank of 23 to 76 is considered to be within the average score range on this test battery (Appendix I). By this definition, all grade groups except the combined 2-3 class females reached an "average" score.

Table 9 represents the results for the AAHPERD Test by grades. These results will be discussed in terms of the percentile scores for each of the test items.

TABLE 9. RESULTS BY GRADE AND SEX FOR THE AAHPERD TEST

GRADE	SEX	M	Mdn	R	S_d	S_{ERROR}
		SKINFOLD *				
K	F	22.489	19.000	41.000	8.790	1.310
	M	17.705	17.000	14.000	2.930	.442
1ST	F	21.629	20.000	21.000	4.697	.794
	M	20.553	19.000	47.000	8.433	1.368
2ND	F	26.200	23.500	51.000	12.944	2.363
	M	18.205	16.000	26.000	5.473	.876
3RD	F	22.714	20.000	50.000	10.216	1.931
	M	17.212	16.000	37.000	7.039	1.225
2-3	F	24.857	27.000	12.000	4.741	1.792
	M	16.917	17.000	12.000	3.288	.949
		SKINFOLD * (PERCENTILE)				
K	F	19.778	15.000	55.000	14.653	2.184
	M	15.114	15.000	40.000	8.726	1.316
1ST	F	22.286	20.000	55.000	13.136	2.220
	M	18.684	15.000	60.000	14.873	2.413
2ND	F	31.333	20.000	70.000	24.598	4.491
	M	28.462	30.000	55.000	15.439	2.472
3RD	F	39.464	40.000	85.000	24.545	4.639
	M	42.121	35.000	85.000	23.553	4.100
2-3	F	27.143	25.000	30.000	12.864	4.862
	M	30.833	25.000	60.000	17.299	4.994

* Results obtained over their clothes.

SIT & REACH

K	F	27.200	28.000	15.000	3.355	.500
	M	26.386	27.000	17.000	3.558	.536
1ST	F	26.600	27.000	17.000	3.362	.568
	M	27.079	28.000	17.000	4.277	.694
2ND	F	26.067	28.000	16.000	4.234	.773
	M	27.667	28.000	17.000	5.012	.803
3RD	F	26.893	27.000	16.000	3.281	.620
	M	26.636	27.000	19.000	4.422	.770
2-3	F	26.714	28.000	10.000	3.861	1.459
	M	25.750	26.500	12.000	3.720	1.074

SIT & REACH (PERCENTILE)

K	F	53.444	60.000	85.000	23.302	3.474
	M	56.636	57.500	85.000	22.555	3.400
1ST	F	47.000	50.000	70.000	19.143	3.236
	M	62.763	72.000	85.000	26.755	4.340
2ND	F	44.500	52.500	70.000	21.308	3.890
	M	62.051	65.000	80.000	27.927	4.472
3RD	F	46.786	45.000	85.000	19.730	3.729
	M	61.182	60.000	89.000	22.238	3.871
2-3	F	46.429	45.000	60.000	23.042	8.709
	M	54.167	60.000	70.000	22.946	6.624

SIT-UPS

K	F	17.773	18.000	30.000	6.668	1.005
	M	15.341	16.000	25.000	6.779	1.022
1ST	F	22.200	24.000	37.000	6.872	1.162
	M	23.000	23.000	37.000	8.091	1.312
2ND	F	17.862	19.000	28.000	5.920	1.099
	M	30.436	31.000	34.000	7.887	1.263
3RD	F	25.037	24.000	27.000	6.029	1.160
	M	29.818	29.000	33.000	8.777	1.528
2-3	F	18.571	18.000	13.000	4.198	1.587
	M	23.833	26.000	26.000	8.288	2.393

SIT-UPS
(PERCENTILE)

K	F	35.341	30.000	90.000	21.442	3.233
	M	28.750	20.000	75.000	22.929	3.457
1ST	F	34.829	35.000	80.000	20.726	3.503
	M	34.342	27.500	75.000	23.970	3.888
2ND	F	16.552	15.000	45.000	10.782	2.002
	M	48.667	55.000	85.000	27.393	4.386
3RD	F	31.852	25.000	85.000	19.072	3.670
	M	40.152	35.000	90.000	28.463	4.955
2-3	F	13.571	10.000	30.000	11.073	4.185
	M	28.750	25.000	65.000	21.860	6.310

9-MINUTE RUN

K	F	1272.293	1249.000	876.000	142.350	22.231
	M	1358.814	1358.000	767.000	147.450	22.486
1ST	F	1305.333	1311.500	665.000	164.142	27.357
	M	1342.474	1359.000	697.000	172.704	28.016
2ND	F	1311.586	1294.000	1083.000	197.416	36.659
	M	1562.658	1535.000	742.000	203.487	33.010
3RD	F	1279.556	1274.000	860.000	194.500	37.432
	M	1430.774	1487.000	872.000	224.271	40.280
2-3	F	1159.333	1150.000	188.000	84.668	34.566
	M	1383.500	1371.500	743.000	200.259	57.810

9-MINUTE RUN
(PERCENTILE)

K	F	54.512	55.000	75.000	16.271	2.541
	M	53.023	55.000	85.000	20.533	3.131
1ST	F	44.583	45.000	75.000	20.049	3.342
	M	32.368	30.000	70.000	18.699	3.033
2ND	F	40.517	35.000	80.000	21.312	3.957
	M	44.737	40.000	75.000	22.147	3.593
3RD	F	29.630	30.000	75.000	19.803	3.811
	M	30.323	30.000	65.000	19.746	3.546
2-3	F	17.500	17.500	15.000	6.892	2.814
	M	28.750	22.500	60.000	19.321	5.577

Skinfold Percentile Score

The highest percentile scores (39.464 and 42.121) were reported for the third grade females and males.

Sit and Reach Percentile Score

The highest mean score (27.667) was reported for second grade males and the lowest mean score (26.067) was reported for the second grade females. The males at all grade levels scored higher than females at their grade level.

Sit-Ups Percentile Score

The highest mean score (48.667) was reported for second grade males and the lowest mean score (16.552) was reported for the second grade females. There was not any set pattern of increased or decreased scores across grade levels for the sit-ups test.

9-Minute Run Percentile Score

The highest 9-minute mean scores (54.512 and 53.023) were reported for the kindergarten females and males. The lowest mean score (29.630) was reported for the third grade females. The performance levels for this test item tended to decrease with grade level. The younger females in K and 1st scored higher than the males in these grade levels.

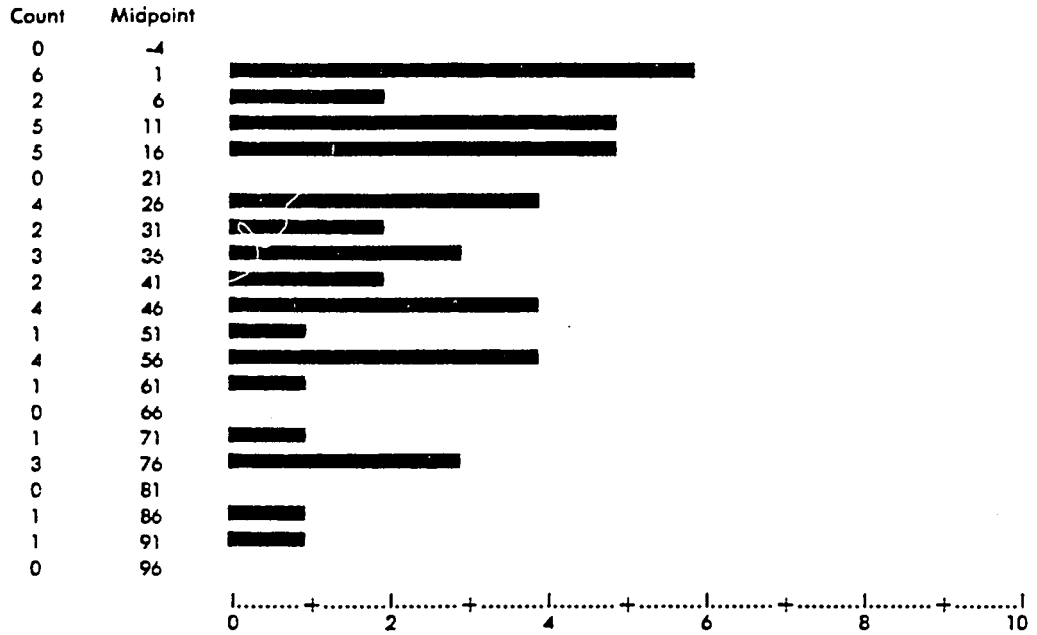
Figures 11 through 20 represent histograms of the percentile ranks for the Bruininks-Oseretsky Test and percentile scores for the AAHPERD Test. The histograms are presented in reference to grade and sex in the same way that these results were used with the classroom teachers. Graphic illustrations assisted in the presentation of the data and served as valuable reference points.

The histograms reveal patterns of individual differences that might be covered up by looking at the group means alone whether female or male or age. The histograms represent the first time that the teachers can observe how the individual children within a grade level scored on the two selected tests. By careful study of the graphs, vast differences can be seen existing in some of the classes. For the purpose of illustration, the histograms for the second graders are discussed.

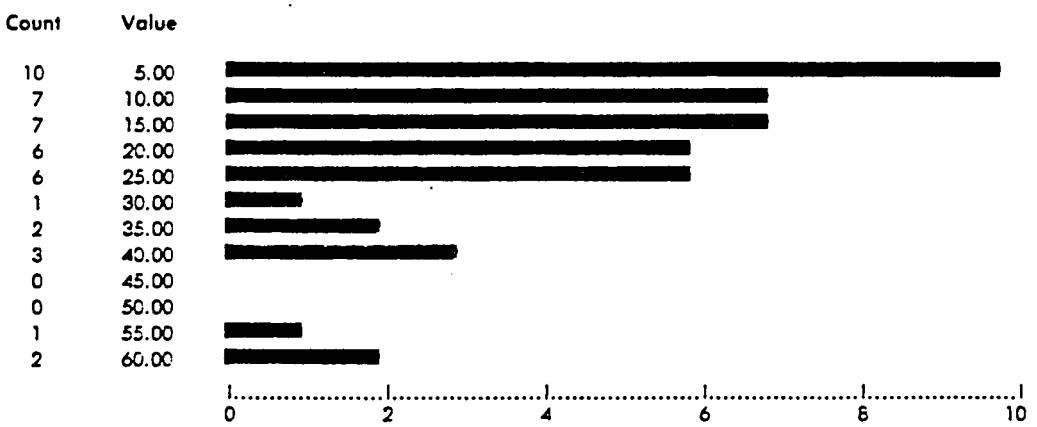
The second grade girls (N = 31) scored inconsistently on the Bruininks-Oseretsky Test of Motor Proficiency. Twenty of the girls scored below the average range of 23 to 76 points on the test. Seven of these 20 girls scored in the 4 point range. The histogram shows a clear break between the girls scoring below the average and above the average. There was a split of 12 points between the two groups. The girls within this group on the average are below the group mean average.

KINDERGARTEN GIRLS (N = 46)

Percentile Rank—B-O Test



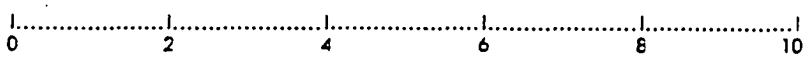
Skinfold Percentile *



* Results obtained over their clothes.

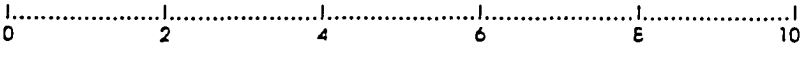
Sit and Reach Percentile

Count	Value
1	5.00
1	10.00
1	15.00
2	20.00
4	25.00
5	30.00
0	35.00
1	40.00
0	45.00
2	50.00
3	55.00
7	60.00
1	65.00
5	70.00
6	75.00
4	80.00
1	85.00
1	90.00



Sit-Up Percentile

Count	Value
5	5.00
1	10.00
2	15.00
4	20.00
6	25.00
5	30.00
2	35.00
3	40.00
7	45.00
3	50.00
0	55.00
1	60.00
0	65.00
2	70.00
1	75.00
0	80.00
1	85.00
0	90.00
1	95.00



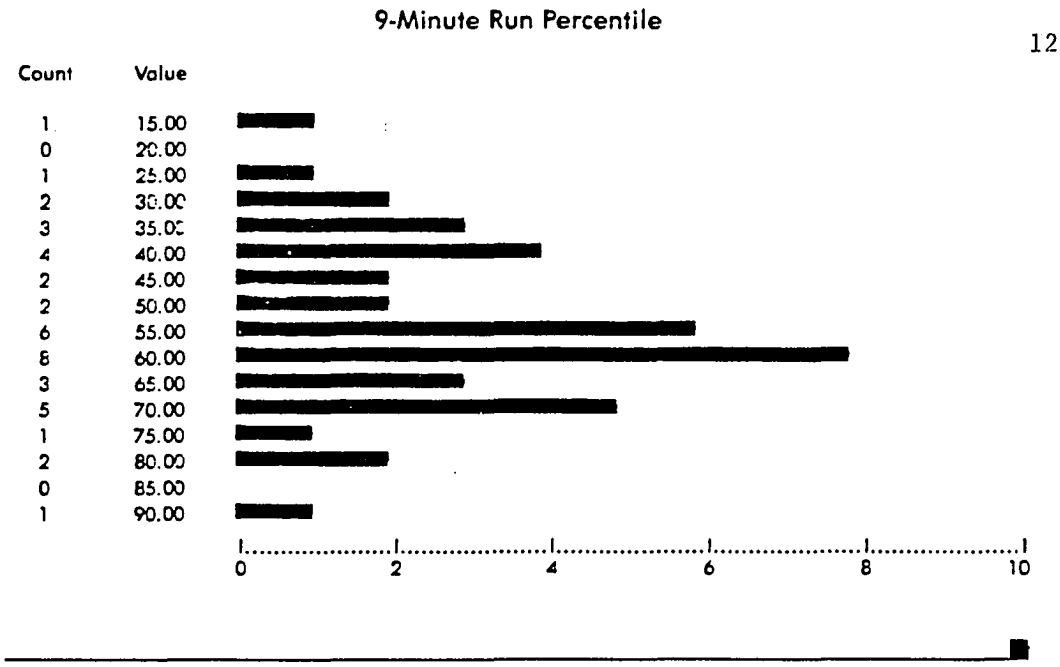
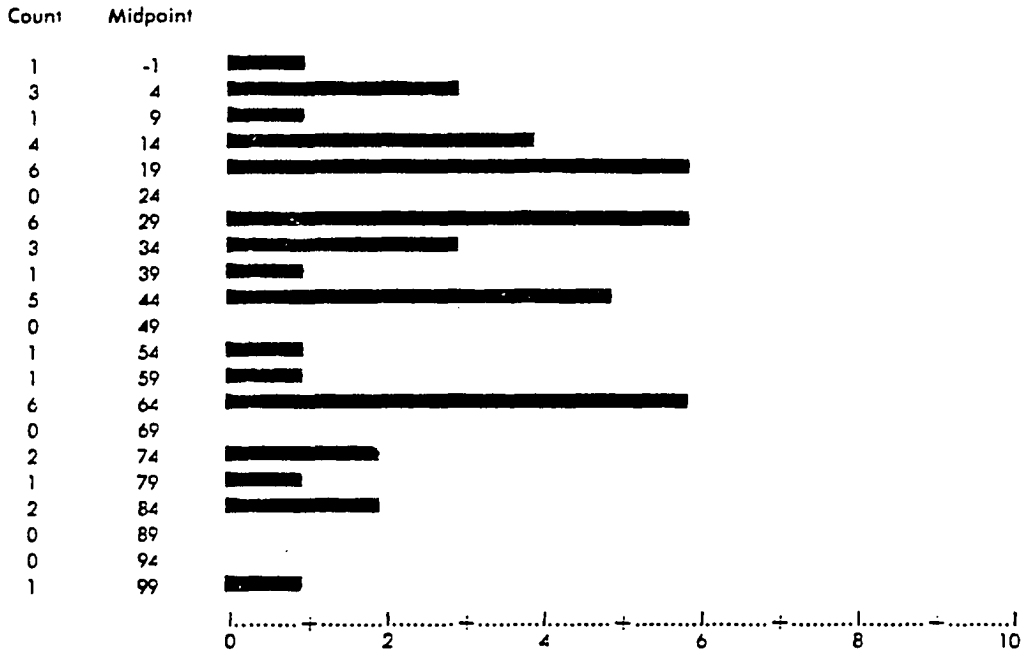


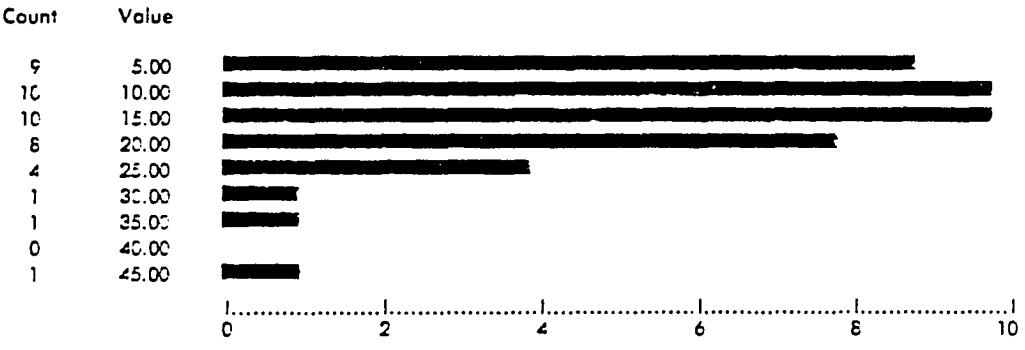
Figure 11. Kindergarten Girls

KINDERGARTEN BOYS (N = 44)

Percentile Rank—B-O Test

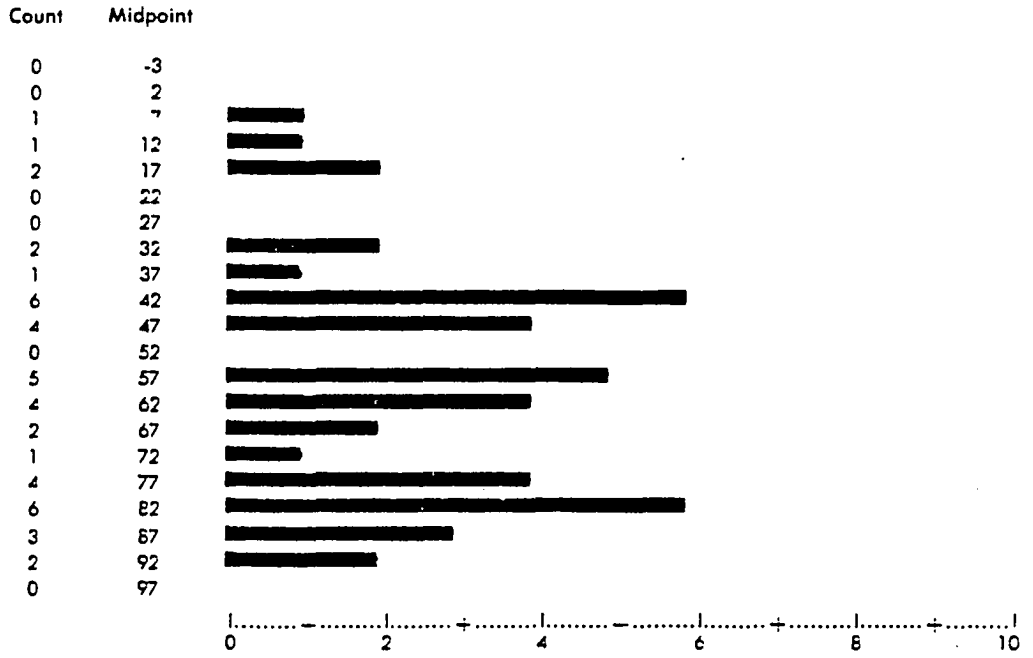


Skinfold Percentile *

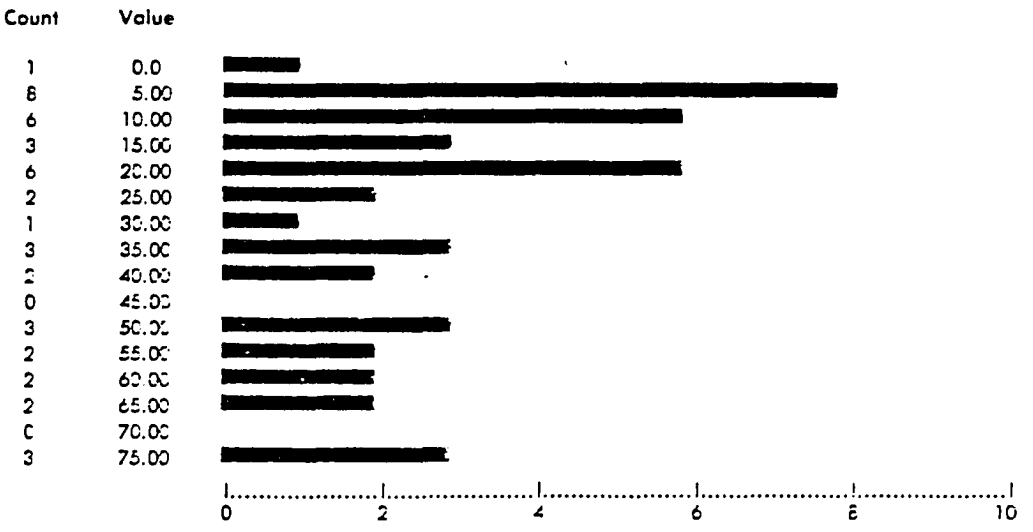


*Results obtained over their clothes.

Sit and Reach Percentile



Sit-Up Percentile



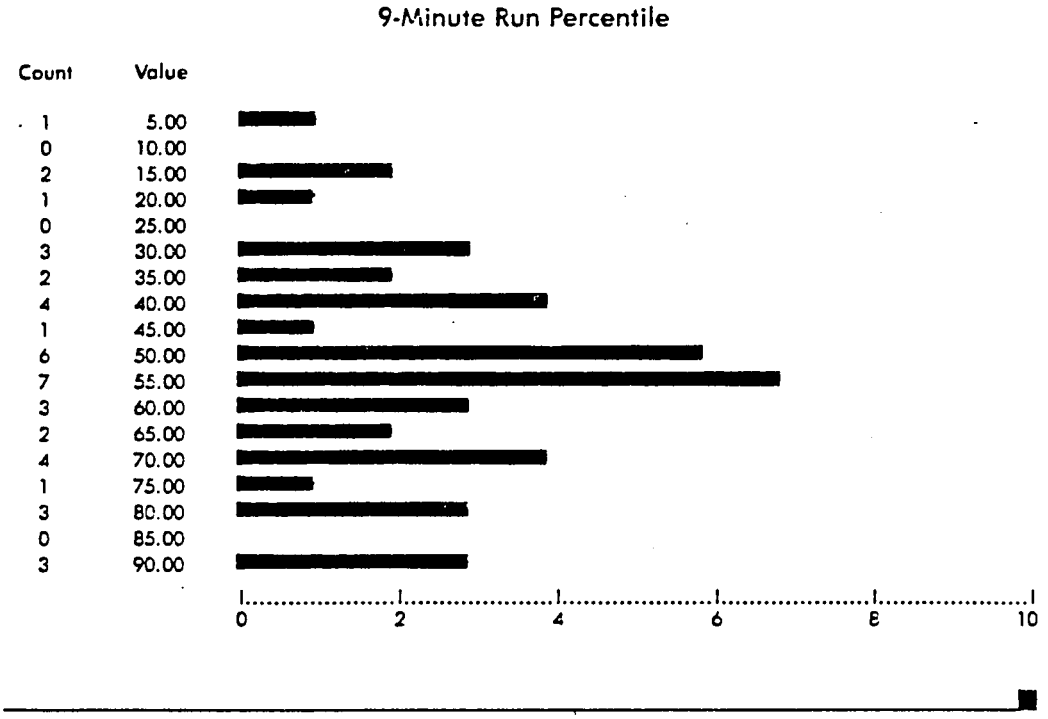
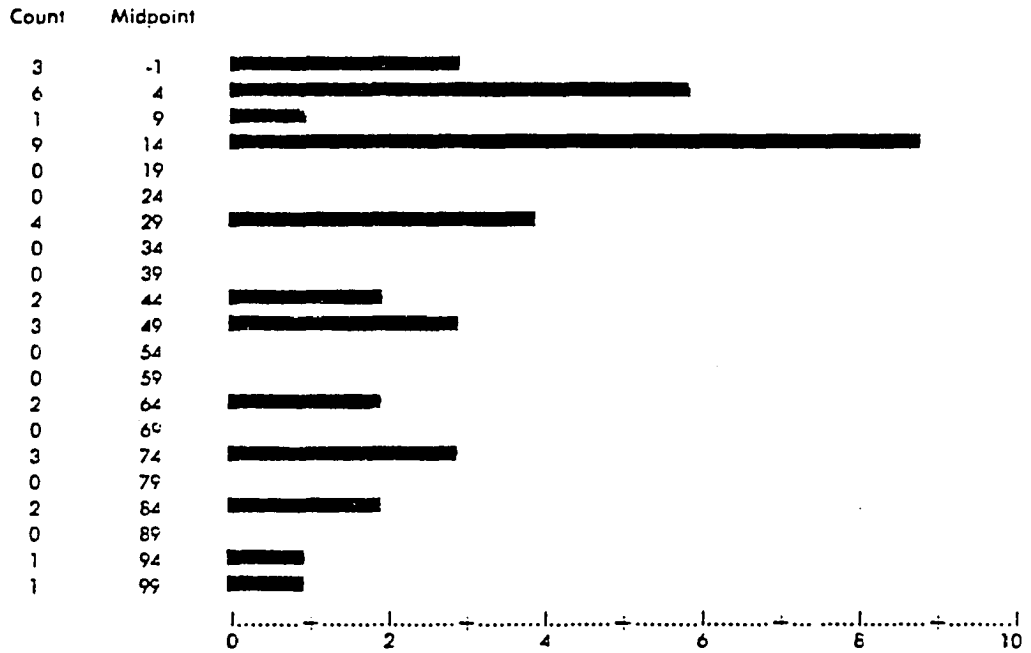


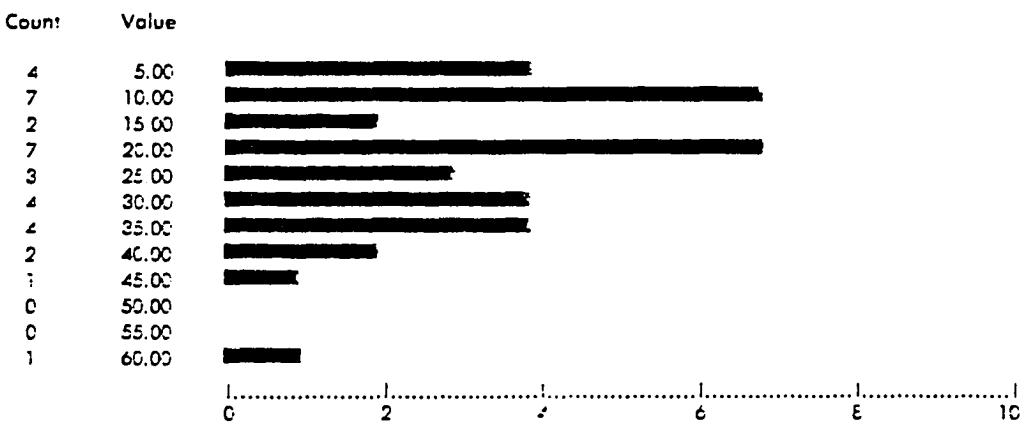
Figure 12. Kindergarten Boys

FIRST GRADE GIRLS (N = 37)

Percentile Rank—B-O Test



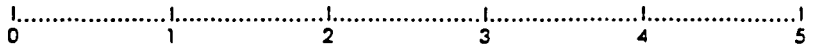
Skinfold Percentile *



*Results obtained over clothes.

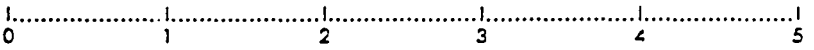
Sit and Reach Percentile

Count	Value
1	5.00
0	10.00
2	15.00
1	20.00
2	25.00
4	30.00
1	35.00
3	40.00
2	45.00
3	50.00
5	55.00
1	60.00
4	65.00
4	70.00
2	75.00



Sit-Up Percentile

Count	Midpoint
1	0
2	4
0	8
2	12
3	16
5	20
2	24
0	28
1	32
4	36
1	40
3	44
0	48
5	52
0	56
2	60
2	64
0	68
1	72
0	76
1	80



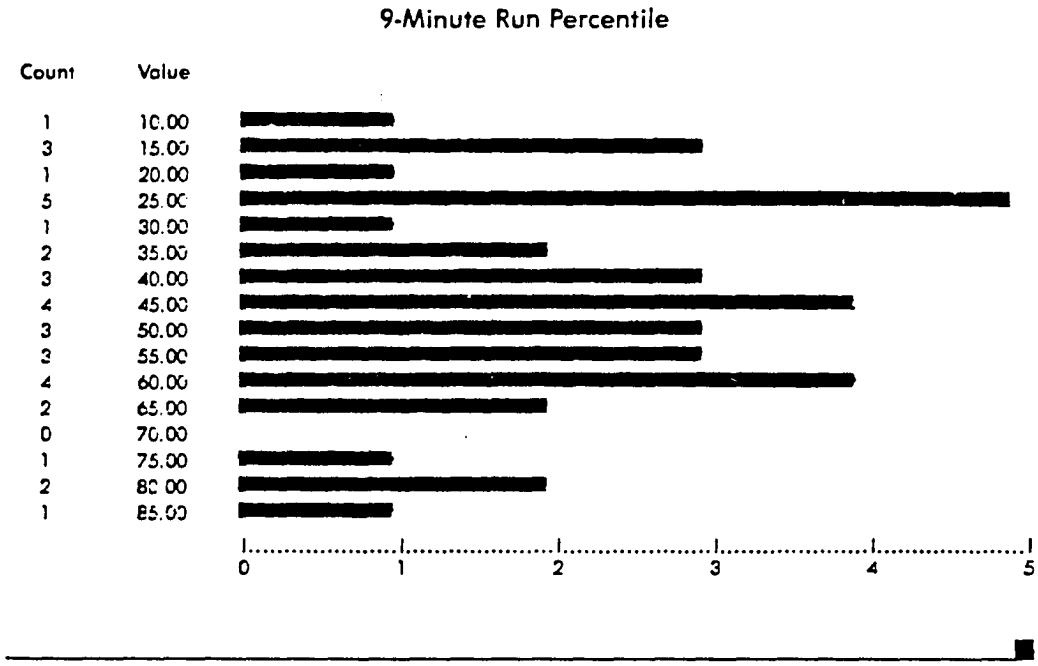
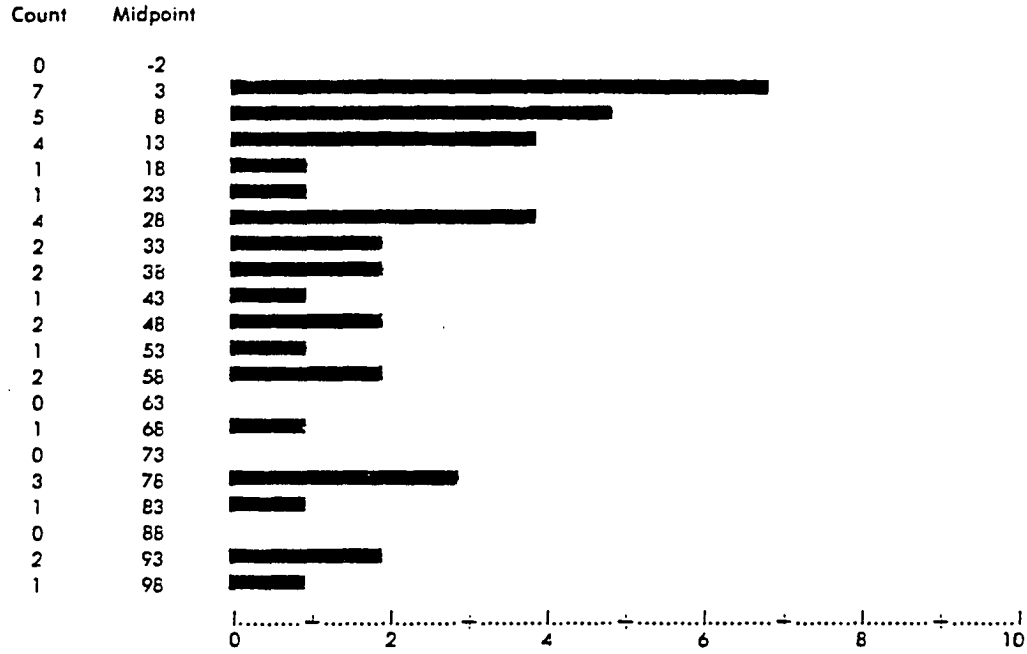


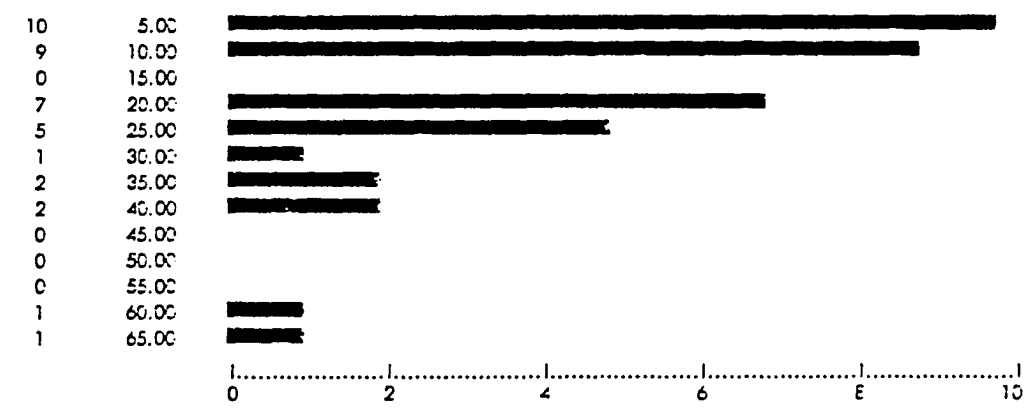
Figure 13. First Grade Girls

FIRST GRADE BOYS (N = 40)

Percentile Rank—B-O Test

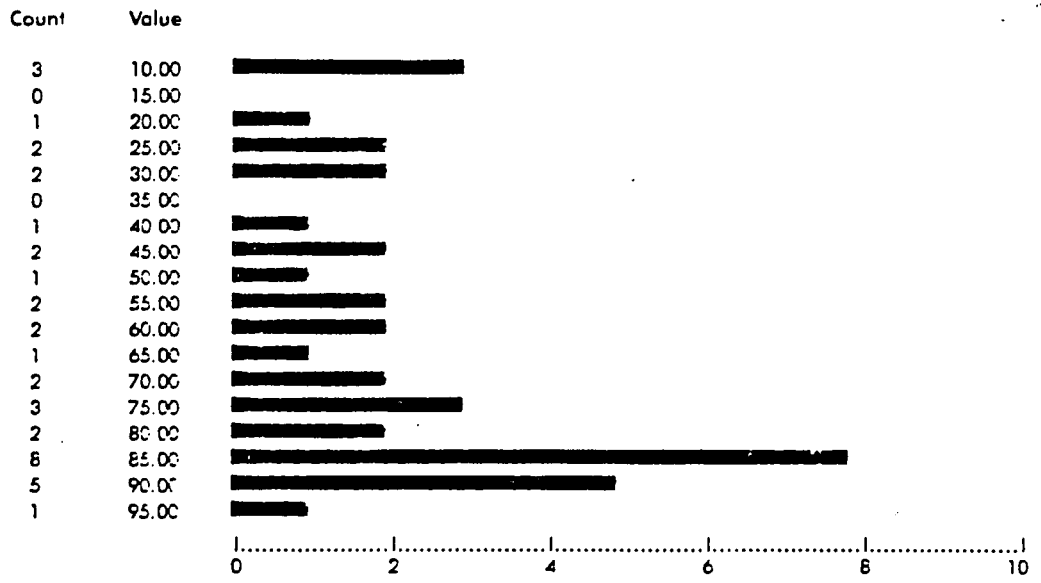


Skinfold Percentile *

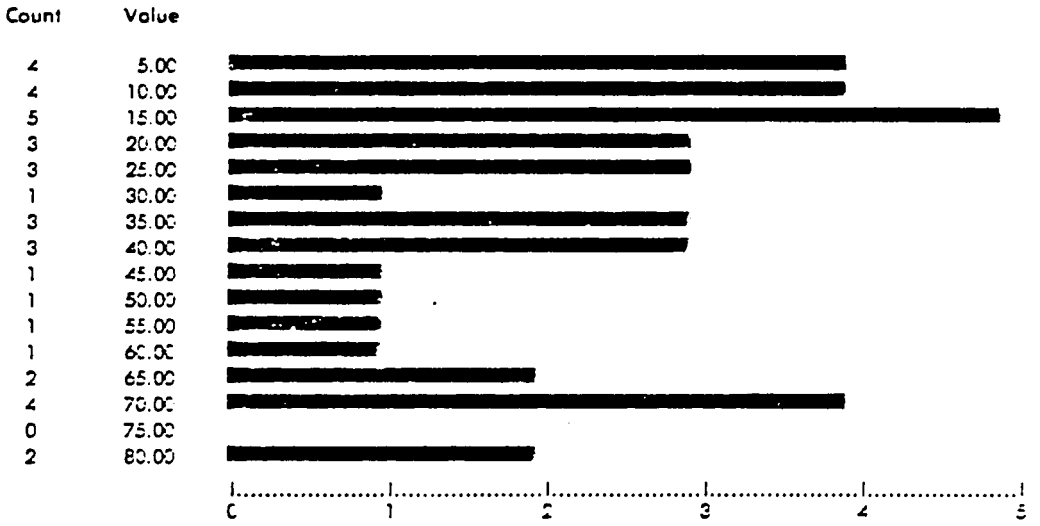


*Results obtained over their clothes.

Sit and Reach Percentile



Sit-Up Percentile



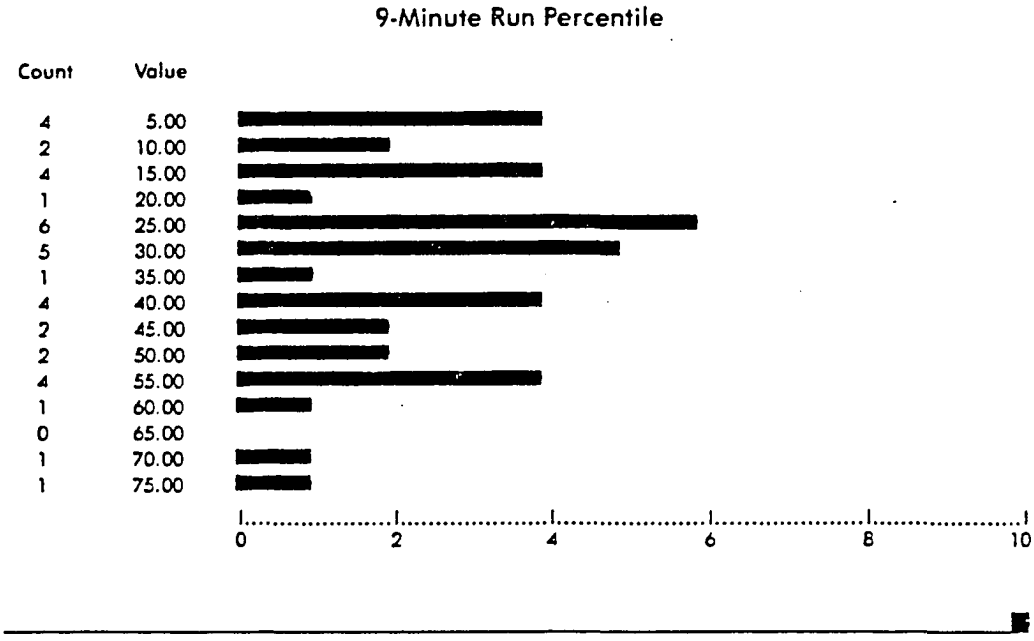
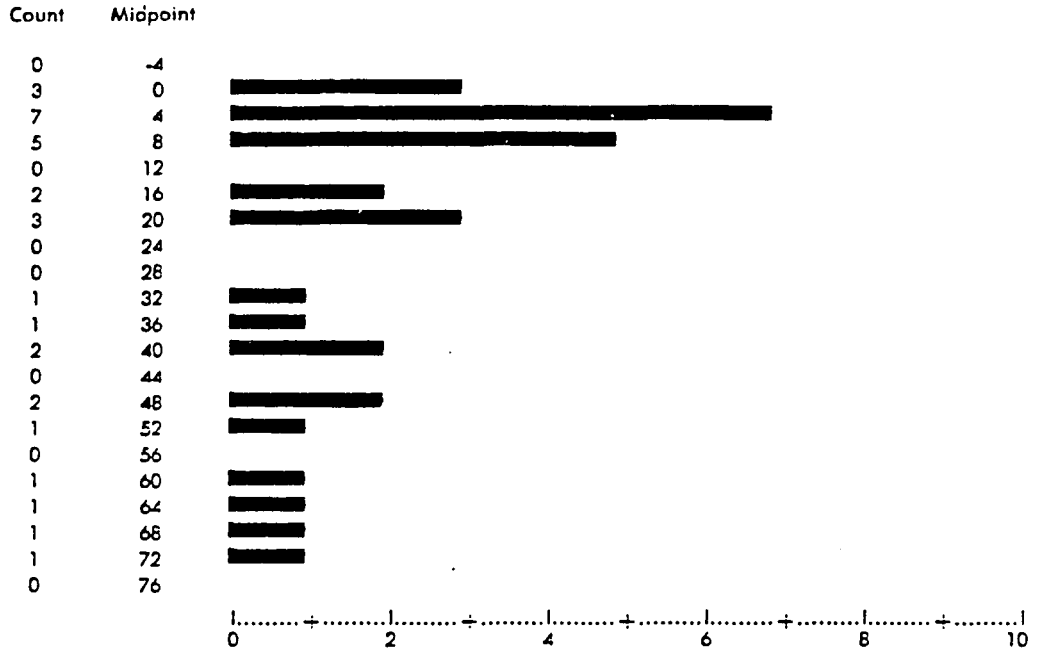


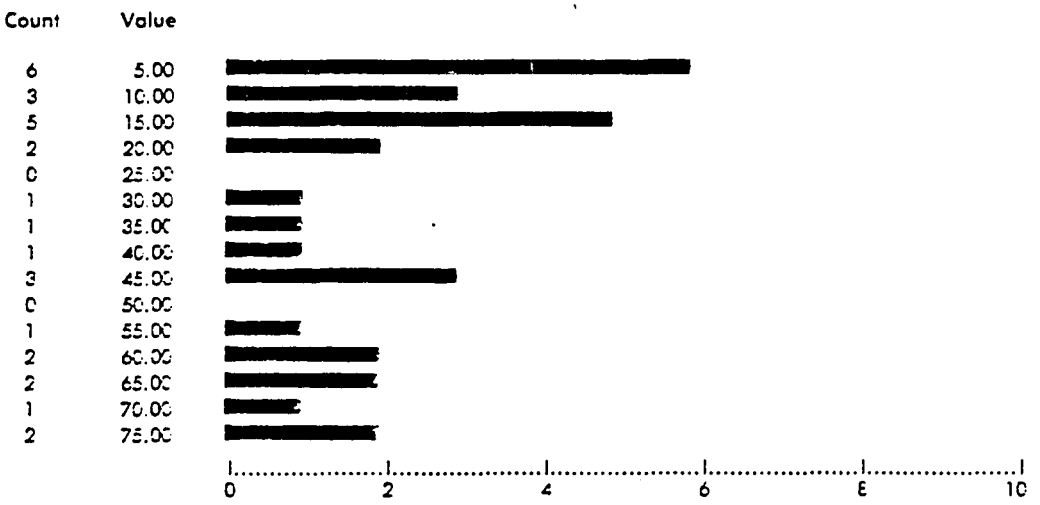
Figure 14. First Grade Boys

SECOND GRADE GIRLS (N = 31)

Percentile Rank—B-O Test

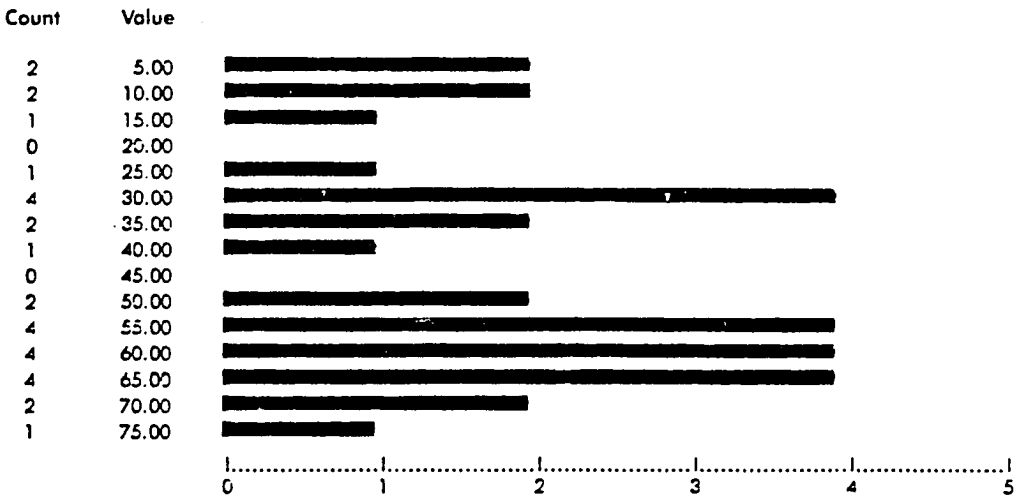


Skinfold Percentile *

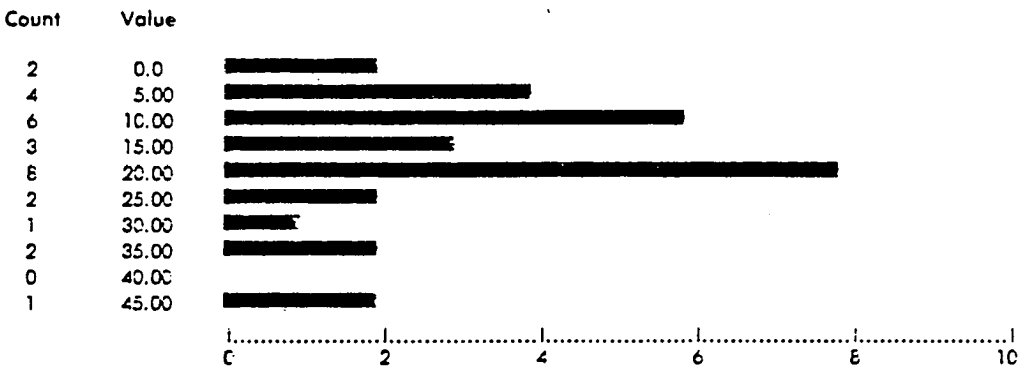


*Results obtained over their clothes.

Sit and Reach Percentile



Sit-Up Percentile



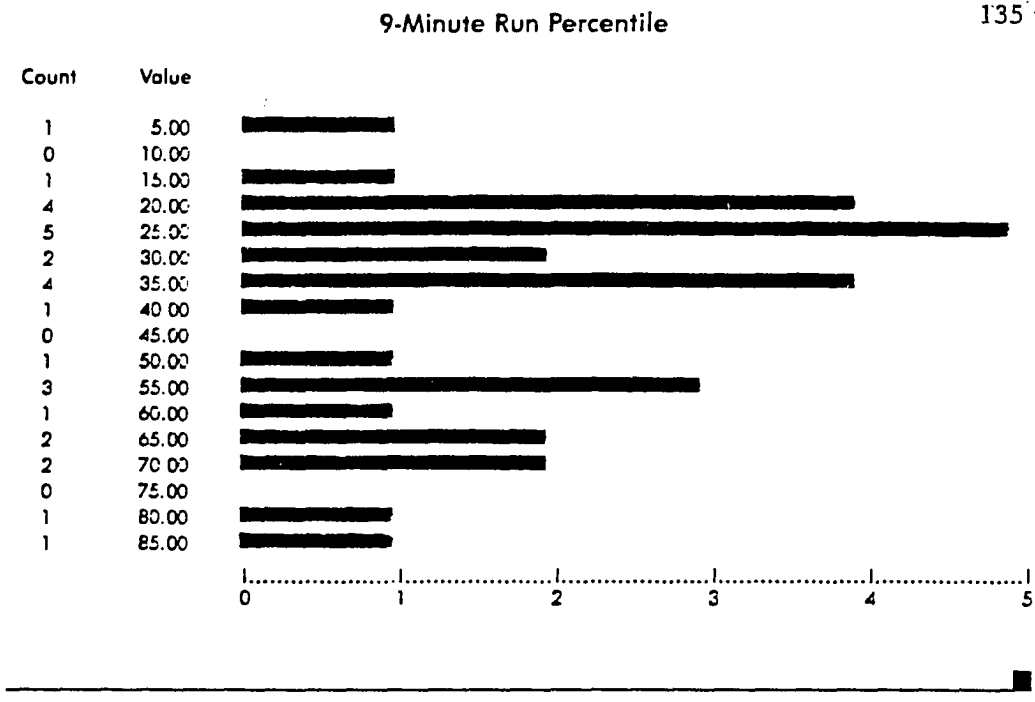
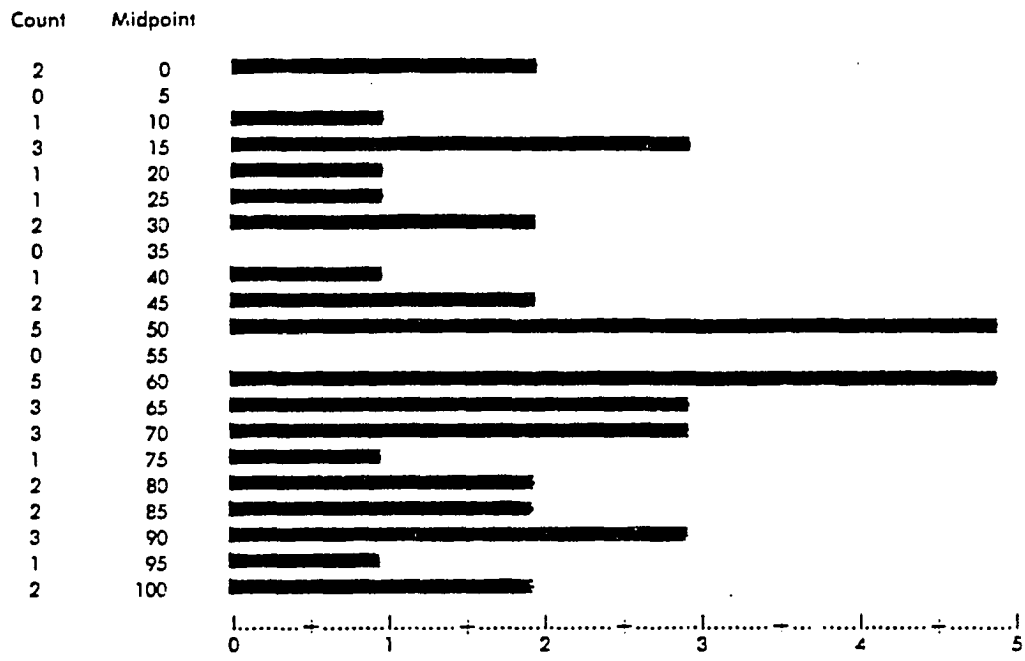


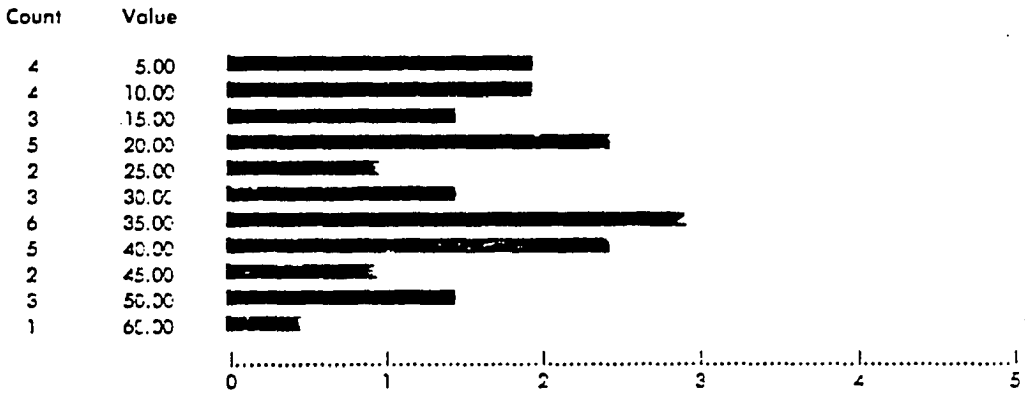
Figure15. Second Grade Girls

SECOND GRADE BOYS (N = 40)

Percentile Rank—B-O Test



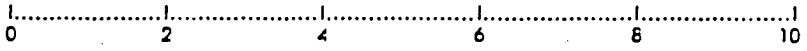
Skinfold Percentile *



*Results obtained over their clothes.

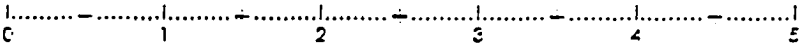
Sit and Reach Percentile

Count	Value
3	15.00
2	20.00
2	25.00
0	30.00
3	35.00
3	40.00
1	45.00
0	50.00
2	55.00
0	60.00
4	65.00
0	70.00
4	75.00
3	80.00
2	85.00
3	90.00
7	95.00



Sit-Up Percentile

Count	Midpoint
0	-3
0	2
1	7
4	12
2	17
3	22
3	27
1	32
1	37
1	42
0	47
3	52
4	57
3	62
1	67
4	72
1	77
0	82
4	87
3	92
0	97



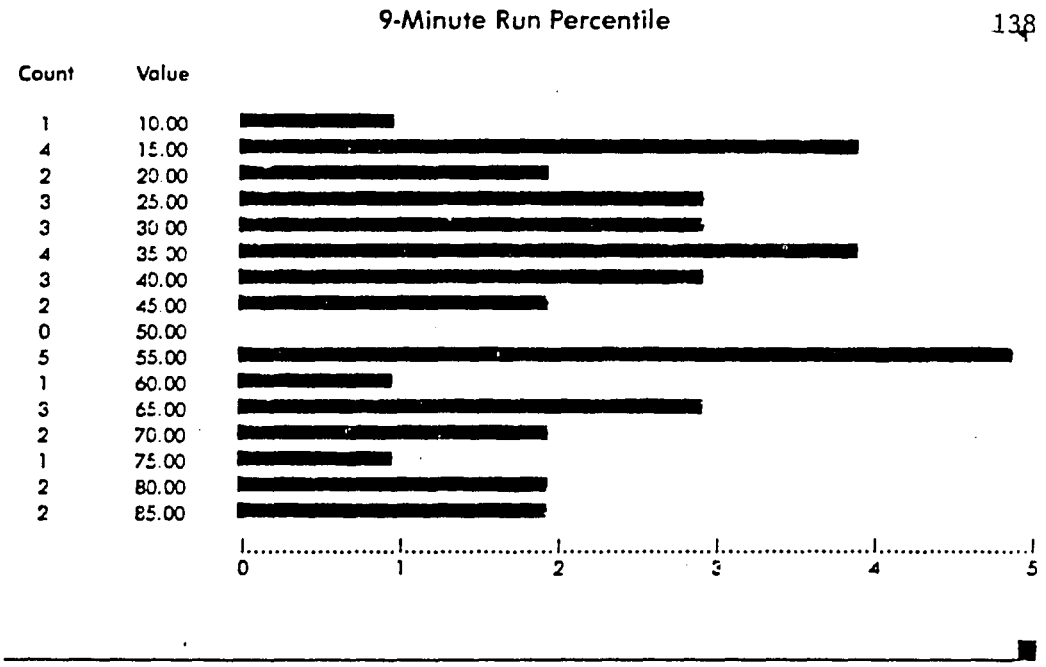
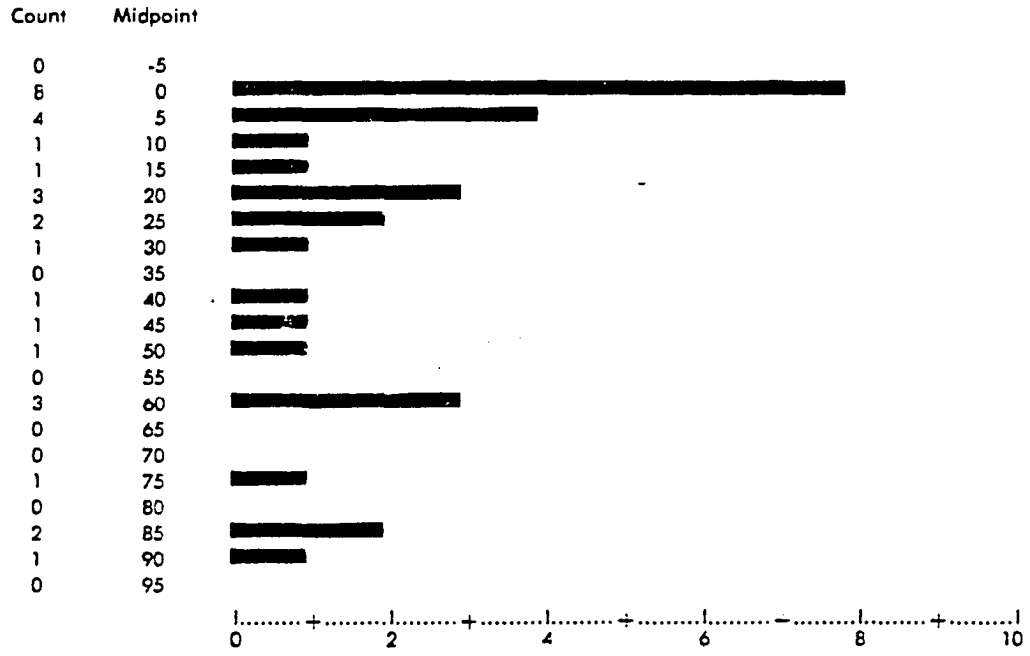


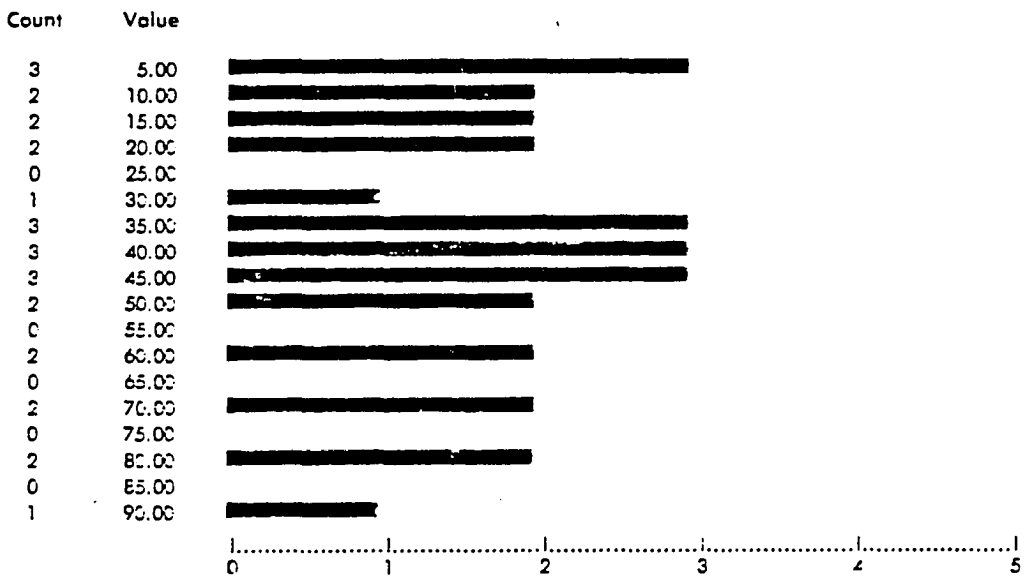
Figure 16. Second Grade Boys

THIRD GRADE GIRLS (N = 30)

Percentile Rank—B-O Test



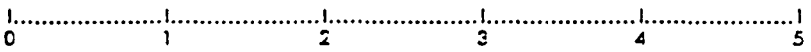
Skinfold Percentile *



*Results obtained over their clothes.

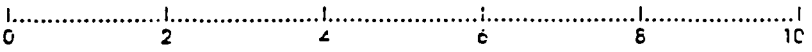
Sit and Reach Percentile

Count	Value
1	10.00
1	15.00
1	20.00
1	25.00
1	30.00
5	35.00
3	40.00
3	45.00
2	50.00
2	55.00
2	60.00
1	65.00
2	70.00
2	75.00
0	80.00
0	85.00
0	90.00
1	95.00



Sit-Up Percentile

Count	Value
2	10.00
1	15.00
7	20.00
5	25.00
5	30.00
0	35.00
1	40.00
1	45.00
1	50.00
1	55.00
1	60.00
1	65.00
0	70.00
0	75.00
0	80.00
0	85.00
0	90.00
1	95.00



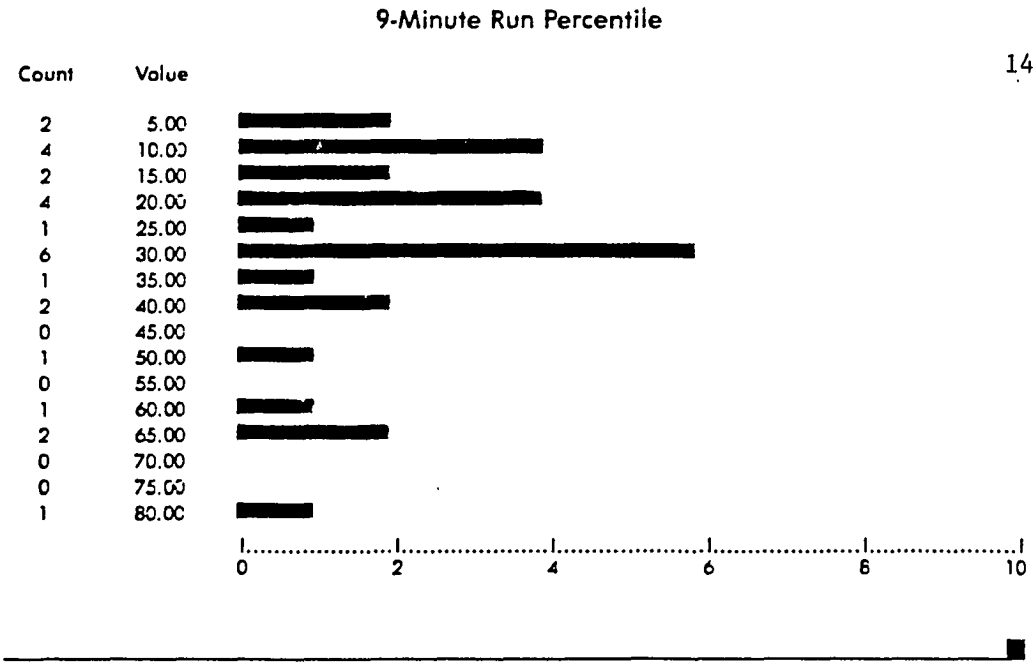
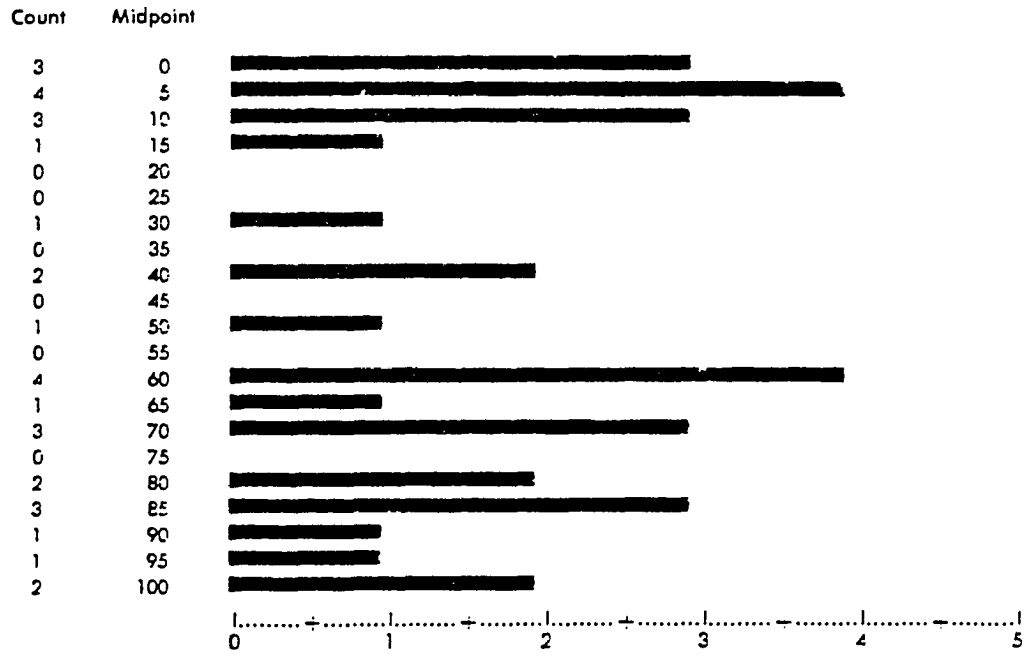


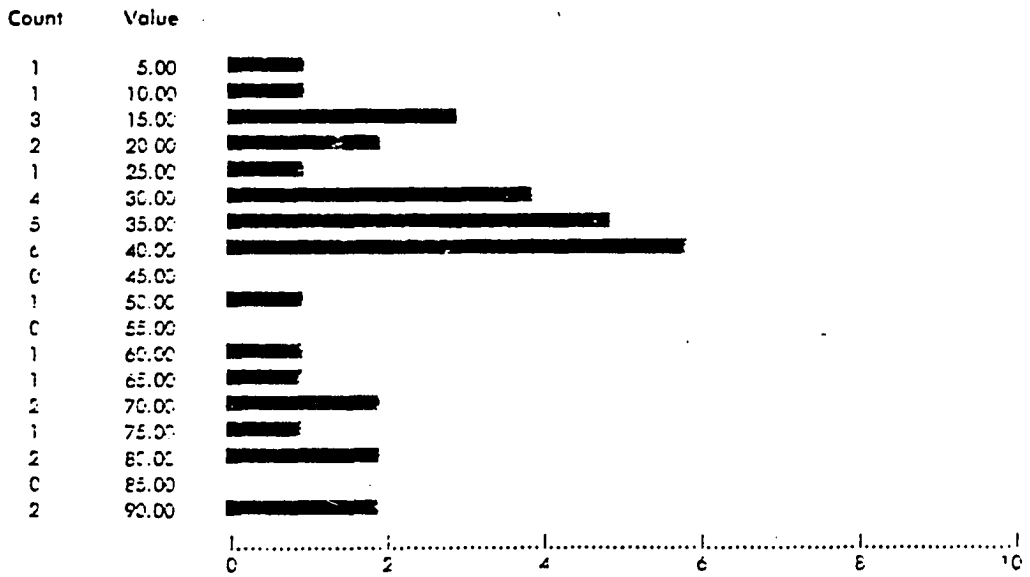
Figure 17. Third Grade Girls

THIRD GRADE BOYS (N = 34)

Percentile Rank—B-O Test



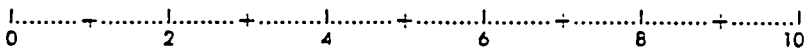
Skinfold Percentile*



*Results obtained over their clothes.

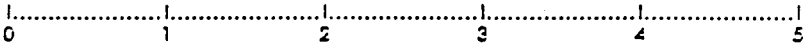
Sit and Reach Percentile

Count	Midpoint
0	4
1	9
1	14
0	19
0	24
1	29
2	34
2	39
2	44
1	49
1	54
7	59
3	64
1	69
3	74
3	79
0	84
0	89
2	94
1	99
0	104



Sit-Up Percentile

Count	Value
2	5.00
4	10.00
2	15.00
4	20.00
3	25.00
1	30.00
3	35.00
2	40.00
1	45.00
1	50.00
1	55.00
0	60.00
1	65.00
2	70.00
1	75.00
1	80.00
1	85.00
1	90.00
2	95.00



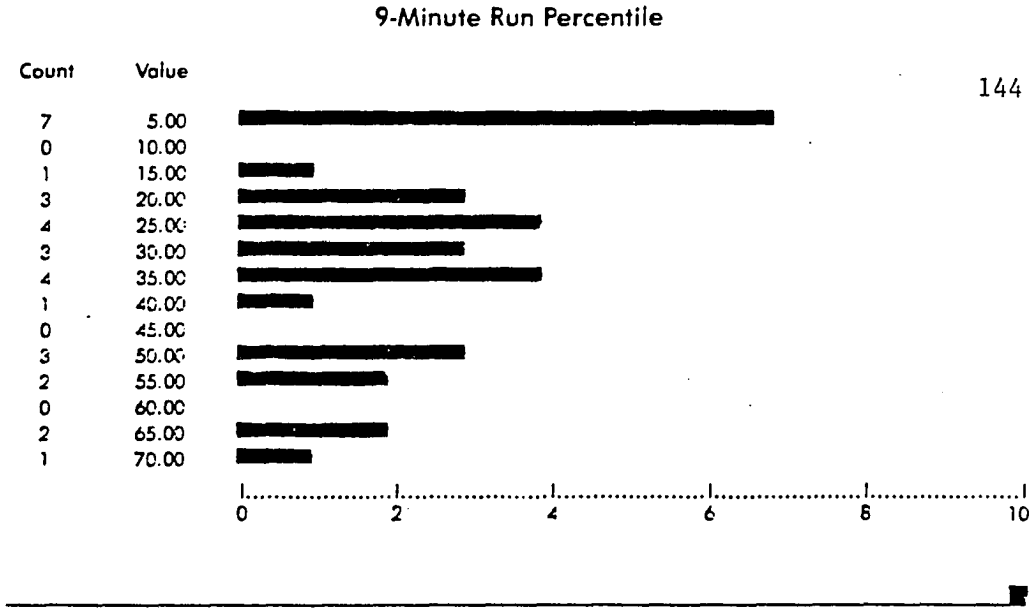
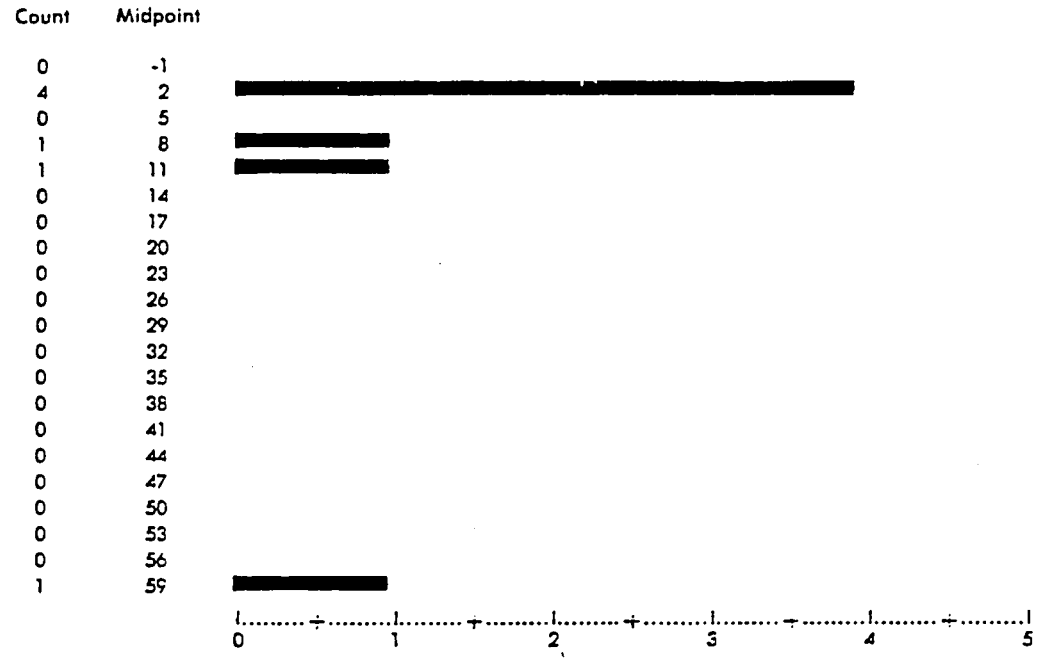


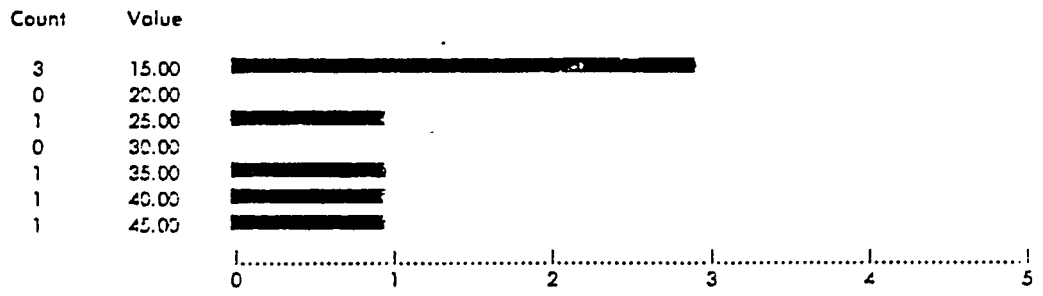
Figure 18. Third Grade Boys

COMBINED SECOND-THIRD GIRLS (N = 7)

Percentile Rank—B-O Test



Skinfold Percentile*



*Results obtained over their clothes.

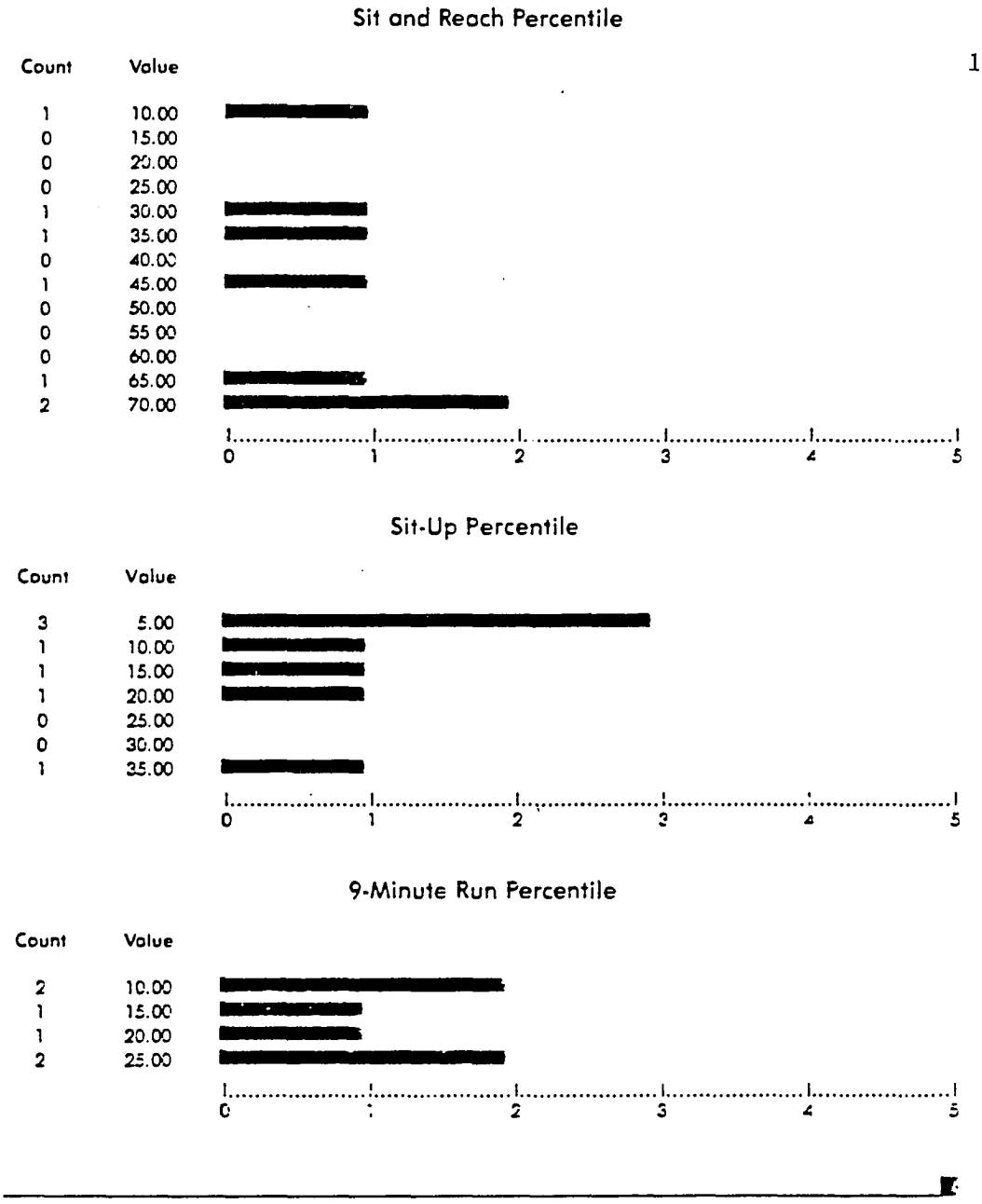
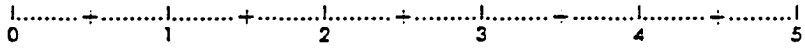


Figure 19. Combined Second-Third Grade Girls

COMBINED SECOND-THIRD BOYS (N = 13)

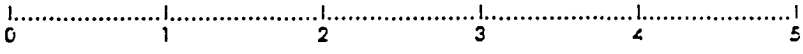
Percentile Rank—B-O Test

Count	Midpoint
0	-1
2	3
0	7
1	11
1	15
0	19
1	23
2	27
0	31
0	35
0	39
1	43
0	47
0	51
1	55
0	59
1	63
1	67
1	71
1	75
0	79



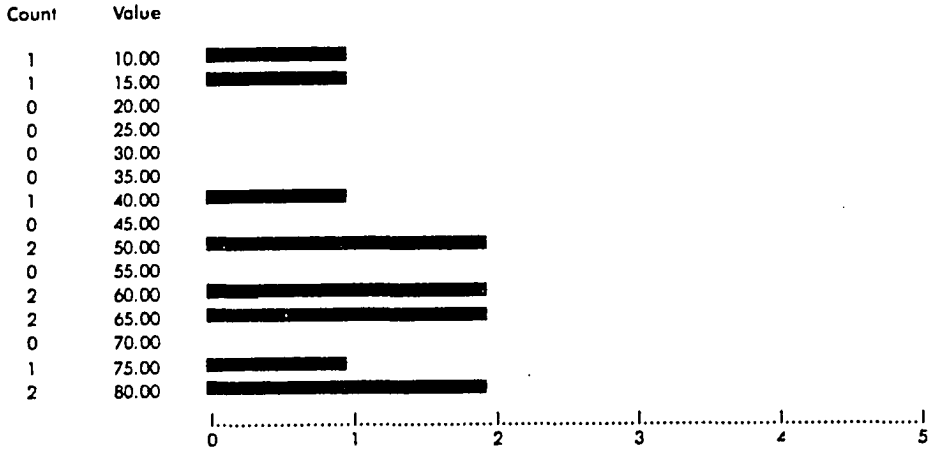
Skinfold Percentile *

Count	Value
2	15.00
1	20.00
4	25.00
3	30.00
0	35.00
0	40.00
0	45.00
0	50.00
1	55.00
0	60.00
0	65.00
0	70.00
1	75.00

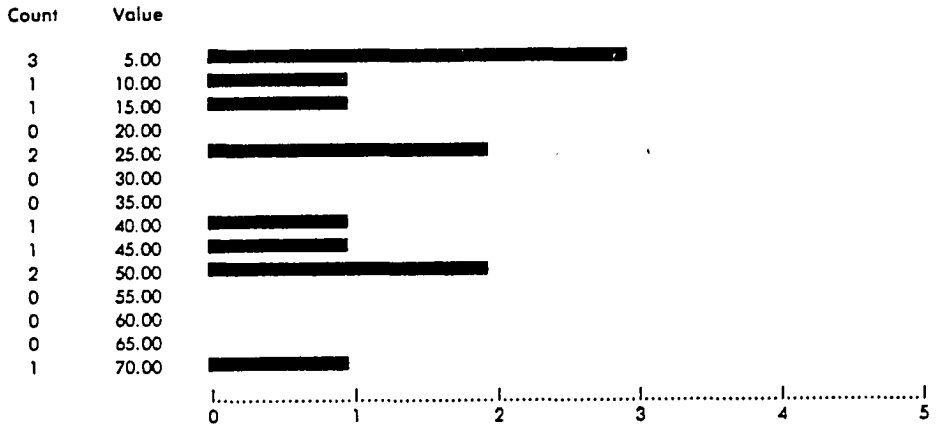


*Results obtained over their clothes.

Sit and Reach Percentile



Sit-Up Percentile



9-Minute Run Percentile

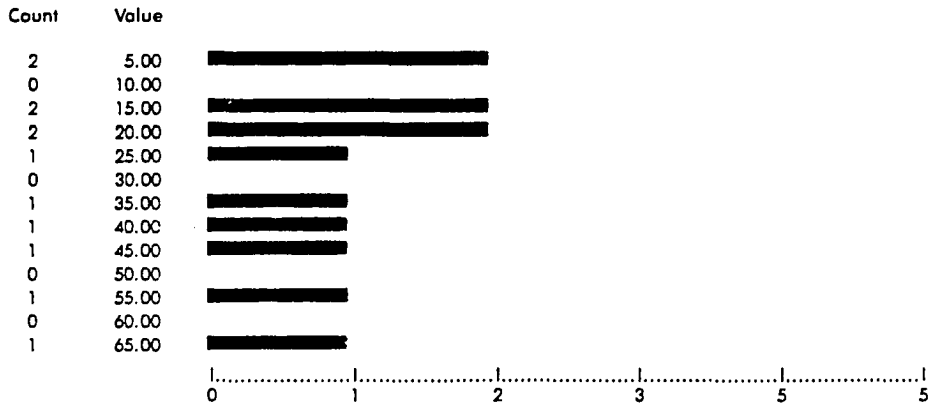


Figure 20. Combined Second-Third Grade Boys

Most boys (N = 40) within this grade level scored considerably better than the girls. Seven of the boys scored below the average range and two boys scored scored in the zero range. Twenty-two of the boys scored above the average range or better and two boys scored in the 100 point range. Ten points separated each noticeable split in scores.

On the AAHPERD Test, the overall performance of the boys on the Sit and Reach test was better than the overall performance of the girls. Seven of the boys scored within the 95th percentile, whereas only one girl scored in the 75th percentile which was the highest score for the girls. Twenty-one of the girls scored within the 50th percentile or higher and 21 of the boys scored within this range. The splits within the boys' scores were more varied than the splits within the girls' scores. The lowest percentile score for the girls was 5 and for the boys it was 15. The range of scores within this test item would clearly point toward individual needs among the students.

For the Sit-Up test, none of the girls scored above the 50th percentile. The highest percentile of 45 was scored by only one girl. The largest number (N = 8) of girls scored in the 20th percentile range and the next largest number (N = 6) scored in the 10th percentile. The boys had three distinct groups. One group scored from the 7th to the 42nd percentile, one group scored from the 52nd percentile to the 77th percentile and one

group group scored from the 87th to the 92nd percentile. For this test item, both boys and girls within the lower percentiles need to increase their abdominal strength and endurance.

For the 9-Minute Run, the boys showed two distinct groupings. One group scored from the 10th to the 45th percentile and the other group scored from the 55th to the 85th percentile. The largest group of boys scored below the 50th percentile. The girls had four distinct groups. One girl scored in the 5th percentile; the next group, which was the largest group, (N = 17) scored between the 15th and the 40th percentile; the next group scored between the 50th and the 70th percentile; and the last group scored between the 80th and 85th percentile.

Using the histograms and the individual score cards, the teacher can spot the individual children within her classroom. The results of the distribution of scores portrayed by the histograms would tend to support a decision to plan for individual differences among children within the same grade level. These teachers can no longer separate children based on sex alone.

The results for the Bruininks-Oseretsky Test and the AAHPERD Test for Individual Classes are included in Appendix J. These small group results will not be discussed in detail in this chapter. The individual class results were, however, discussed with each classroom teacher. The information was given to the teacher for her records and the students' Individual Record Form for the Bruininks-Oseretsky Test and the Score Card

for the AAHPERD Test was placed in the individual student's school record file.

Nonparametric Statistical Analyses

Nonparametric statistical analyses were used to inform the investigator about further research possibilities and further hypotheses and to strengthen the interpretation in describing the performance scores of the students from Green Grove on the two test batteries. Tables 10- 21 report the analyses of the group comparisons.

In Table 10 the significant median differences found between the females and males on various items from the Bruininks-Oseretsky Test are reported. Significant differences were found in two gross motor tasks (running speed and agility and bilateral coordination), in two combined fine and gross motor tasks, (upper-limb coordination #5 & #3), and in two fine motor tasks, (response speed and upper-limb speed and dexterity). These findings were similar to those reported by Bruininks (1978).

Table 11 presents the significant median differences found between the females and males on various items from the AAHPERD Test. Significant differences were found for the skinfold test, sit-ups, and the 9-minute run.

TABLE 10. MANN-WHITNEY U-TEST RESULTS FOR THE BRUNININKS-OSERETSKY TEST

(N = 150 FEMALES AND 170 MALES)
.10 Significance Level P = .00457

TEST ITEMS:	SEX	MEAN RANK	P VALUE
BRUININKS-OSERETSKY POINT SCORES:			
RSPD #1	F	122.75	.000
	M	193.81	
BILAT #6	F	144.43	.0015
	M	173.68	
STRENGTH	F	125.99	.000
	M	190.95	
UPLIMB #5	F	131.21	.000
	M	186.34	
UPLIMB #3	F	138.04	.000
	M	180.32	
RESPEED	F	134.04	.000
	M	183.04	
UPLMSP #3	F	176.09	.000
	M	146.74	
BRUININKS-OSERETSKY COMPOSITE SCORES:			
POINT SCORE TOTAL	F	136.65	.000
	M	180.72	
STANDARD SCORE	F	135.70	.000
	M	181.53	
PERCENTILE RANK	F	135.74	.000
	M	181.53	
STANINE	F	134.61	.000
	M	182.54	

TABLE 11. MANN-WHITNEY U-TEST RESULTS FOR THE AAHPERD TEST

TEST ITEM:	SEX	MEAN RANK	P VALUE
AAHPERD RAW SCORES:			
SKINFOLD *	F	189.45	.000
	M	126.78	
SIT-UPS	F	133.95	.002
	M	172.08	
9-MINUTE RUN	F	118.33	.000
	M	179.03	
AAHPERD PERCENTILE SCORES:			
SIT AND REACH	F	131.53	.000
	M	177.38	

* Results obtained over their clothes.

The Kruskal-Wallis One-Way ANOVA was used to determine whether any of two research groups of age, sex or grade differed from each other to a significant degree on any particular test score or set of test scores. Figures 21 and 22 present charts of the Kruskal-Wallis One-Way ANOVA results by age, sex and grade.

The overall view shows significant differences to exist for 12 of the 14 test items by age on the Short Form of the Bruininks-Oseretsky Test. The only two items not significantly different for the age groups were bilateral coordination #1 and visual-motor control #5. Seven test items were significantly different for the sexes and nine of the test items were significantly different for the grade levels.

For the AAHPERD Test three out of the four test items were significantly different for the sexes. The only item not significant for the sexes was the Sit and Reach test. The Sit-ups test was significant for all three variables of age, sex and grade. The Sit-ups test item was the only significant item for the age variable.

Tables 12-17 represent the results of the Kruskal-Wallis One-Way ANOVA by Age, Sex, and Grade for the Bruininks-Oseretsky and the AAHPERD Test. Four of the test

BRUININKS-OSERETSKY POINT SCORES:

TEST ITEM	AGE	SEX	GRADE
RSPD #1	X	X	X
BAL #2	X	-	X
BAL #7	-	-	X
BILAT #6	X	X	X
STRENGTH	X	X	X
UPLMB #5	X	X	-
UPLMB #3	X	X	-
RESPEED	X	X	-
VISMOT #8	X	-	X
VISMOT #3	X	-	X
UPLMSP #7	X	-	X
UPLMSP #3	X	X	X
BRUININKS-OSERETSKY COMPOSITE SCORES: POINT SCORE TOTAL	X	X	X
STANDARD SCORE	X	X	-
PERCENTILE RANK	X	X	-
STANINE	X	X	-

Figure 21. Overall Summary of Kruskal-Wallis One-Way ANOVA for the Bruininks-Oseretsky Test

X = significant - = not significant

AAHPERD RAW SCORES:

TEST ITEM	AGE	SEX	GRADE
SKINFOLD*	-	X	X
SIT-UPS	X	X	X
9-MINUTE RUN	-	X	X

AAHPERD PERCENTILE SCORES:

SKINFOLD	X	-	X
SIT AND REACH	-	X	-
9-MINUTE RUN	X	-	-

* Results obtained over their clothes.

Figure 22. Overall Summary of Kruskal-Wallis One-Way ANOVA for the AAHPERD Test

X = significant - = not significant

TABLE 12. KRUSKAL-WALLIS ONE-WAY ANOVA BY AGE FOR THE BRUININKS-OSERETSKY TEST
(.10 Significance level is p = .00457)

BRUININKS-OSERETSKY POINT SCORES:

TEST ITEM	AGE	MEAN RANK	P VALUE
RSPD #1	6	96.27	.000
	7	113.63	
	8	146.60	
	9	198.82	
	10	221.01	
	11	240.07	
BAL #2	6	144.17	.001
	7	127.71	
	8	165.85	
	9	168.11	
	10	193.77	
	11	200.43	
BILAT #6	6	111.91	.000
	7	115.78	
	8	157.99	
	9	193.79	
	10	201.34	
	11	187.50	
STRENGTH	6	81.39	.000
	7	111.27	
	8	145.16	
	9	230.97	
	10	221.86	
UPLMB #5	6	114.20	.000
	7	121.20	
	8	156.98	
	9	192.72	
	10	184.02	
	11	254.43	
UPLMB #3	6	121.19	.000
	7	113.01	
	8	151.85	
	9	195.93	
	10	203.73	
	11	230.14	

RESPEED	6	92.41	.000
	7	123.87	
	8	163.14	
	9	194.14	
	10	192.63	
	11	199.00	
VISMOT #8	6	94.91	.000
	7	123.82	
	8	164.81	
	9	183.85	
	10	205.94	
	11	210.86	
VISMOT #3	6	119.09	.000
	7	125.13	
	8	157.62	
	9	183.18	
	10	210.89	
	11	141.64	
UPLMSP #7	6	107.98	.000
	7	110.23	
	8	147.44	
	9	186.26	
	10	233.66	
	11	260.86	
UPLMSP #3	6	90.03	.000
	7	112.68	
	8	151.96	
	9	200.53	
	10	219.67	
	11	206.64	

BRUININKS-OSERETSKY COMPOSITE SCORES:

ITEM	AGE	MEAN RANK	P VALUE
POINT SCORE TOTAL	6	70.42	.000
	7	95.23	
	8	150.33	
	9	213.05	
	10	234.11	
	11	233.08	
STANDARD SCORE	6	220.06	.0001
	7	167.79	
	8	150.61	
	9	166.46	
	10	128.59	
	11	82.83	
PERCENTILE RANK	6	219.30	.0001
	7	168.81	
	8	150.64	
	9	165.96	
	10	128.14	
	11	84.83	
STANINE	6	224.27	.000
	7	167.63	
	8	149.64	
	9	167.08	
	10	126.44	
	11	85.42	

TABLE 13. KRUSKAL-WALLIS ONE-WAY ANOVA BY AGE FOR THE AAHPERD TEST

AAHPERD RAW SCORES:

TEST ITEM:	AGE	MEAN RANK	P VALUE
SIT-UPS	6	92.40	.000
	7	111.83	
	8	169.03	
	9	179.45	
	10	189.10	
	11	202.29	
AAHPERD PERCENTILE SCORES:			
SKINFOLD*	6	104.63	.000
	7	117.33	
	8	150.96	
	9	175.76	
	10	218.95	
	11	196.00	
9-MINUTE RUN	6	223.62	.000
	7	189.19	
	8	141.05	
	9	132.90	
	10	100.93	
	11	143.42	

* Results obtained over their clothes.

TABLE 14. KRUSKAL-WALLIS ONE-WAY ANOVA RESULTS BY SEX FOR THE BRUININKS-OSERETSKY TEST

BRUININKS-OSERETSKY POINT SCORES:

TEST ITEM	SEX	MEAN RANK	P VALUE
RSPD #1	F	122.75	.000
	M	193.81	
BILAT #6	F	144.43	.0015
	M	174.68	
STRENGTH	F	125.99	.000
	M	190.95	
UPLMB #5	F	131.21	.000
	M	186.34	
UPLMB #3	F	138.04	.000
	M	180.32	
RESPEED	F	134.04	.000
	M	183.04	
UPLMSP #3	F	176.09	.000
	M	146.74	

BRUININKS-OSERETSKY COMPOSITE SCORES:

ITEM	SEX	MEAN RANK	P LEVEL
POINT SCORE TOTAL	F	136.65	.000
	M	180.72	
STANDARD SCORE	F	135.70	.000
	M	181.57	
PERCENTILE RANK	F	135.74	.000
	M	181.53	
STANINE	F	134.61	.000
	M	182.54	

TABLE 15. KRUSKAL-WALLIS ONE-WAY ANOVA RESULTS BY SEX FOR THE AAHPERD TEST

AAHPERD RAW SCORES:

TEST ITEM	SEX	MEAN RANK	P VALUE
SKINFOLD*	F	189.45	.000
	M	126.78	
SIT-UPS	F	133.95	.002
	M	172.08	
9-MINUTE RUN	F	118.33	.000
	M	179.03	
AAHPERD PERCENTILE SCORES:			
SIT AND REACH	F	131.53	.000
	M	177.38	

* Results obtained over their clothes.

TABLE 16. KRUSKAL-WALLIS ONE-WAY ANOVA RESULTS BY GRADE FOR THE BRUININKS-OSERETSKY TEST

BRUININKS-OSERETSKY POINT SCORES:

TEST ITEM	GRADE	MEAN RANK	P VALUE
RSPD #1	K	95.85	.000
	1ST	136.41	
	2ND	188.09	
	3RD	233.22	
	2-3	218.30	
BAL #7	K	132.84	.000
	1ST	151.54	
	2ND	183.06	
	3RD	202.48	
	2-3	111.65	
BAL #2	K	126.06	.000
	1ST	152.18	
	2ND	175.62	
	3RD	192.05	
	2-3	199.18	
BILAT #6	K	108.53	.000
	1ST	136.21	
	2ND	201.21	
	3RD	208.59	
	2-3	194.90	
STRENGTH	K	90.07	.000
	1ST	129.89	
	2ND	194.05	
	3RD	234.84	
	2-3	242.80	
UPLIMB #3	K	108.77	.000
	1ST	144.07	
	2ND	192.07	
	3RD	210.70	
	2-3	189.27	

UPLIMB #5	K	109.39	.000
	1ST	155.18	
	2ND	185.46	
	3RD	208.04	
	2-3	175.73	
RESPEED	K	103.70	.000
	1ST	162.09	
	2ND	192.49	
	3RD	204.31	
	2-3	155.57	
VISMOT #8	K	109.17	.000
	1ST	155.45	
	2ND	186.23	
	3RD	204.33	
	2-3	184.80	
VISMOT #3	K	111.26	.000
	1ST	166.56	
	2ND	174.42	
	3RD	189.05	
	2-3	223.52	
UPLMSP #7	K	93.11	.000
	1ST	141.88	
	2ND	179.92	
	3RD	237.27	
	2-3	225.48	
UPLMSP #3	K	96.77	.000
	1ST	138.64	
	2ND	187.26	
	3RD	230.48	
	2-3	217.35	

BRUININKS-OSERETSKY COMPOSITE SCORE:

POINT SCORE TOTAL	K	68.56	.000
	1ST	139.58	
	2ND	207.49	
	3RD	244.93	
	2-3	217.40	

TABLE 17. KRUSKAL-WALLIS ONE-WAY ANOVA RESULTS BY GRADE FOR THE AAHPERD TEST

AAHPERD RAW SCORES:

TEST ITEM	GRADE	MEAN RANK	P VALUE
SIT-UPS	K	94.16	.000
	1ST	164.07	
	2ND	180.46	
	3RD	204.90	
	2-3	150.61	
9-MINUTE RUN	K	135.82	.0007
	1ST	138.07	
	2ND	190.38	
	3RD	154.14	
	2-3	126.47	

AAHPERD PERCENTILE SCORES:

SKINFOLD*	K	116.61	.000
	1ST	133.24	
	2ND	173.85	
	3RD	212.63	
	2-3	186.58	
9-MINUTE RUN	K	202.56	.000
	1ST	140.40	
	2ND	157.56	
	3RD	106.19	
	2-3	84.83	

* Results obtained over their clothes.

items which showed up to be significantly different were significantly different for age, sex and grade. The four test items on the Bruininks-Oseretsky Test which were significantly different for all three variables were running speed & agility, bilaterial #6, strength, and upper-limb speed & dexterity #3.

Pearson Product-Moment Correlations

The Pearson Product-Moment Correlations were computed to show to what extent test scores were related in this research group. An intercorrelation matrix was computed to show the relationships among the 18 test items by age, sex and grade for the Green Grove children. A correlation of .70 to .90 was accepted as a high enough correlation value for the relationship to be reported.

Table 18 represents the results of the Pearson r between test items. The only test items from the Bruininks-Oseretsky Test which were highly correlated were running speed & agility with strength. None of the test items of the AAHPERD Test were correlated to each other. No correlations were found to exist between any two items on the Bruininks-Oseretsky Test with the AAHPERD Test. Therefore, it would be necessary to administer all test items to assess motor proficiency and health-related fitness for the Green Grove K-3 children.

TABLE 18. PEARSON PRODUCT-MOMENT CORRELATIONS BY TEST ITEMS

BRUININKS-OSERETSKY POINT SCORES:

TEST ITEMS	r =
RUNNING SPEED & AGILITY WITH STRENGTH	.7446

TABLE 19. PEARSON PRODUCT-MOMENT CORRELATIONS BY SEX

BRUININKS-OSERETSKY TEST:

ITEMS	SEX	r =
RUNNING SPEED AND AGILITY WITH STRENGTH	F	.7230
	M	.7228
POINT SCORE WITH RUNNING SPEED & AGILITY	F	.7291
	M	.7785
POINT SCORE WITH STRENGTH	F	.7760
	M	.7762
AAHPERD TEST:		
SIT-UPS RAW SCORE WITH UPLIMB #7	F	.8164
SIT-UPS PERCENTILE SCORE WITH VISMOT # 3	F	.8164
9-MINUTE RUN WITH POINT SCORE (B-O TEST)	F	.8362
9-MINUTE PERCENTILE AND UPLMSP #3	F	.8362

Table 19 reports the high correlations among the test items by sex. The only test items which correlated for both males and females on the Bruininks-Oseretsky Test were running speed and agility with strength. For the AAHPERD Test, sit-ups correlated with upper-limb speed and dexterity #7 for females.

Table 20 shows the high relationships between the test items for the different age groups. Running speed and agility correlated with strength for 6-, 8-, and 9-year-olds. These were the only two items with high correlations within the variable of age.

Table 21 shows the high relationships among test items by the different grades. Again running speed and agility with strength were the only items with a high correlation within any grade. These items correlated highly with each other for the second graders.

As would be expected, significant correlations were found between raw scores and percentile rank, standard scores, total point scores, and stanine scores for the Bruininks-Oseretsky Test, and raw scores and percentile ranks for the AAHPERD Test. These correlations are not reported.

TABLE 20. PEARSON PRODUCT-MOMENT CORRELATIONS BY AGE

BRUININKS-OSERETSKY TEST:

TEST ITEMS	AGE	r =
RUNNING SPEED & AGILITY WITH STRENGTH	6	.7095
	8	.7749
	9	.7280

TABLE 21. PEARSON PRODUCT-MOMENT CORRELATIONS BY GRADE

BRUININKS-OSERETSKY TEST:

TEST ITEMS	GRADE	r =
RUNNING SPEED & AGILITY WITH STRENGTH	2ND	.7300

Teacher Questionnaire

A teacher questionnaire was designed by the investigator to elicit information from the teachers about what they thought were important objectives for their physical education classes and to determine whether the teachers thought the two tests given provided needed information for them. The Teacher Questionnaire consisted of two parts. In Part I of the questionnaire (Table 22), the teachers were asked to rank the physical education goals for the North Carolina Public Schools as stated in documents from the State Department of Public Instruction (1983). In order to gain a preassessment view of the rank order of the offical goals, the teachers were given Part I before there was any testing of any children at Green Grove School. A postassessment measure was taken after the completion of all data interpretation sessions with the teachers. Any differences in her pre and postassessment ranking were discussed with the teacher in her personal interview.

The results of Part I revealed that 7 out of the 13 teachers thought goal 1, " to develop a positive self-image which includes self awareness and understanding" was the most important goal for her class. In repeating Part I the second time, 6 out of the 13 thought that goal 1 was still the most important. Seven of the teachers changed their minds about the other items in ranking order. When asked why there was a

Table 22. TEACHER QUESTIONNAIRE
FOR A PHYSICAL EDUCATION STUDY
SPRING 1984

Part I

Directions: Five physical education goals have been proposed for elementary school programs.* Please indicate the order of importance the program goals have for your class. One equals the most important and five equals the least important goal for your class. These goals are not ranked in order of importance.

GOALS:

_____ 1. To develop a positive self-image which includes self awareness and understanding.

_____ 2. To develop efficient and effective motor skills that will enable each pupil to handle his body skillfully and safely in all daily activities.

_____ 3. To develop interest and proficiency in using skills for successful participation in worthwhile recreational activities.

_____ 4. To develop and maintain the best possible level of performance, understanding, and appreciation for physical fitness to meet the demands of wholesome living.

_____ 5. To develop desirable social behavior as the basis for group living in a democracy.

Please list any other goals you have for your class.

*A Framework for physical education K-12. Raleigh, North Carolina: State Department of Education.

change in the order of importance, most of the teachers stated that they could not remember how they ranked them the first time. Others stated that they believed all the goals were important and that the order would change during the year. Table 22 presents Part I of the Teacher Questionnaire. Table 23 shows how the teachers ranked the goals.

Table 23. TEACHER'S RANKING OF GOALS

GRADE	TEACHER'S NUMBER	RANK 1ST TIME	RANK 2ND TIME
K	1	1 3 5 4 2	2 1 3 4 5
	2	1 3 5 2 4	1 4 5 2 3
	3	1 4 5 3 2	5 3 4 2 1
1ST	4	5 3 4 2 1	2 4 5 3 1
	5	4 1 2 3 5	4 1 2 3 5
	6	1 2 5 3 4	3 1 4 2 5
2ND	7	3 2 5 1 4	1 4 3 2 5
	8	3 1 4 2 5	3 1 2 4 5
	9	4 1 3 2 5	1 3 2 4 5
3RD	10	1 4 5 2 3	1 5 3 4 2
	11	2 3 5 1 4	4 1 3 2 5
	12	1 4 3 5 2	1 2 5 3 4
2-3	13	1 2 4 5 3	1 2 4 5 3

In order to ascertain the answers to the questions posed in Subproblems II and III, Part II of the questionnaire was administered to the teachers (Table 23). The results are presented in Table 25.

The results suggest that the classroom teachers favored the Bruininks-Oseretsky Test of Motor Proficiency over the AAHPERD Health-Related Fitness Test. Two reasons for this may be

Table 24. TEACHER QUESTIONNAIRE
Part II

Directions: Please circle the answer which expresses your feelings concerning the two tests.

1. The information obtained from the Bruininks-Oseretsky Test of Motor Proficiency has been helpful to me in recognizing some of the specific motor needs of the children in my class.

   Strongly agree Agree Disagree Strongly disagree Undecided

2. The information obtained from the AAHPERD Health-Related Test has been helpful to me in recognizing some of the specific motor needs of the children in my class.

   Strongly agree Agree Disagree Strongly disagree Undecided

3. The results of the Bruininks-Oseretsky Test of Motor Proficiency could be useful to me in selecting class physical education objectives.

   Strongly agree Agree Disagree Strongly disagree Undecided

4. The results of the Bruininks-Oseretsky Test of Motor Proficiency could be useful to me in selecting individual student physical education objectives.

   Strongly agree Agree Disagree Strongly disagree Undecided

5. The results of the AAHPERD Health-Related Fitness Test could be useful to me in selecting class physical education objectives.

   Strongly agree Agree Disagree Strongly disagree Undecided

6. The results of the AAHPERD Health-Related Fitness Test could be useful to me in selecting individual student physical objectives.

   Strongly agree Agree Disagree Strongly disagree Undecided

7. I will administer the Bruininks-Oseretsky Test of Motor Proficiency in the future.

   Strongly agree Agree Disagree Strongly disagree Undecided

8. I will administer the AAHPERD Health-Related Fitness Test in the future.

   Strongly agree Agree Disagree Strongly disagree Undecided

TABLE 25. RESPONSES TO TEACHER QUESTIONNAIRE: PART II

TEACHERS #		QUESTIONS:							
		1	2	3	4	5	6	7	8
1		SA	A	A	SA	SA	A	A	A
2		SA	A	SA	SA	SA	SA	A	A
3		SA	SA	A	A	A	A	SA	SA
4		A	SA	A	SA	SA	A	U	U
5		SA	SA	A	A	A	SA	U	U
6		A	A	A	A	A	A	D	D
7		A	A	SA	SA	SA	SA	U	U
8		A	A	A	A	A	A	U	U
9		A	A	SA	SA	SA	A	A	A
10		A	A	SA	SA	SA	SA	A	A
11		SA	SA	A	SA	SA	SA	U	U
12		SA	SA	SA	SA	SA	SA	A	A
13		SA	SA	SA	SA	SA	SA	A	A
TOTAL	SA	53%	47%	47%	69%	69%	53%	7%	7%
	A	47%	53%	53%	31%	31%	47%	46%	46%
	U							38%	38%
	D							7%	7%

due to the fact that more information is obtained from this test and that the teachers saw a correlation between this test and some classroom activities.

Another result suggests that the classroom teachers were hesitant to strongly agree that they would administer the two tests in the future. Teachers' reasons given for this were lack of equipment, time, and testers. When asked if they would give the tests again if these problems were resolved, all the teachers strongly agreed. The teachers also suggested that the tests be given at the beginning of the school year so that they would have time to use the information.

The teachers were asked if they understood the concepts of "needs assessment", motor proficiency, and health-related fitness, and all the teachers seemed to understand. The teachers expressed a desire to know more about these topics as they related to their children, and many recommended an inservice workshop for this purpose.

Summary of Findings

The central issue addressed in this study was the assessment of the motor proficiency and the health-related fitness status for an entire K-3 elementary school. The assessment data were used to describe the existing motor performance levels of the K-3 children. This description was interpreted by the investigator for the teachers in order to introduce them to the use of selected motor assessment data for the development of physical education objectives.

The initial concern of this investigation addressed the question: "Do classroom teachers in a selected K-3 elementary school view a motor proficiency and health-related fitness data base as being useful in developing physical education objectives?" In order to answer this question the following problems were addressed: (1) What is the status of K-3 children on the motor proficiency and health-related fitness tests; (2) To what extent do classroom teachers report that the motor proficiency and health-related fitness data could be useful information for the development of K-3 physical education objectives; and (3) How helpful and practical do the testing strategies developed in the study seem to be for future use by the teachers at the selected school?

Student Data

Descriptive data analyses were used to discuss the status of Green Grove K-3 children on the motor proficiency and health-related fitness tests, and nonparametric statistics were used to discuss the significance of any differences which were found. The general result of the two tests indicate the following: (1) The overall results of the Bruininks-Oseretsky Test of Motor Proficiency indicate that when all of the children at Green Grove are considered,the mean percentile rank of 36.5 was within the average range of 23 to 76 points. (2) The overall results of the AAHPERD Health-Related Test report the test items of sit-ups and the 9-minute run as being below the 50th percentile for the overall group.

A closer analysis of the data uses the variables of age, sex and grade to describe the motor performance and the health-related fitness of these children. The findings from these analyses reveal the following: (1) The average score for the males was always above the group mean for each age level, whereas the average score for the females fell below the average group mean at the 7-to 8-year-old level and continued to decline throughout the 10-year-old level. (2) The average mean score for the males at each age level was higher than the average mean score of the females on the sit and reach test. (3) The average mean score for the males increased with age on the sit-ups test, whereas the average mean score for the females decreased with age. (4) The 5- to 7-year-old males' and female's average mean scores on the 9-minute run were higher than at any other age level; after this point the scores decreased with age. The age-related total point scores supported the findings reported by Broadhead and Bruininks (1982), which indicated that over the span of 5 through 14 years of age, the mean performance curves for both boys and girls are markedly linear for all 14 test items on the Short Form of the Bruininks-Oseretsky Test.

Bachman (1961) reported that performance levels varied considerably with age over the range of 6 to 26 years of age. The present study would also make this statement and support the findings of Rarick (1973) that the performance of young children is varied. This usual variation maybe be due to the fact that the children are still experimenting and learning the skills.

The results indicated by the influence of sex and age variables were as follows: (1) The average mean scores for the male were higher on running speed and agility, standing broad jump, the two subtests of bilateral coordination, response speed on the Bruininks-Oseretsky Test. (2) The average mean scores for the females were higher on the balance subtest and upper-limb speed and dexterity. (3) The visual-motor control subtest average mean scores for both females and males increased with age. These findings are similar to those reported by Broadhead and Bruininks (1982). They found that sex differences in the mean performance were demonstrated for 11 of the 14 test items. For the four gross motor subtests, the single item assessing strength, and running speed and agility favored the boys and the subtests of balance and bilateral coordination favored the girls. They also reported that upper-limb speed favored the boys and upper-limb speed and dexterity favored the girls as was true at Green Grove School.

The age and sex results for the AAHPERD Test indicated the following: (1) The average mean scores for the males were higher on the sit-and-reach test and sit-ups. (2) The average mean scores of all groups children were below the 50th percentile on the sit-ups and the 9-minute run test. (3) The average mean scores for the 9-minute run test decreased with age for both sexes. These findings are similar to those reported by Ross, Dotson, Gilbert and Katz (1985). They reported that boys can do more sit-ups, stretch farther, and have less body fat as they reach the older teens; however, times on distance runs level off

or decline around 15 or 16 years of age. However, this does not explain why the performance on the 9-minute run of the Green Grove K-3 children would decline. Hensley, East, and Stillwell (1982) also found significant differences between boys and girls on all physical performance tests. The boys were reported as having higher performance levels. Pissanos, Moore, and Reeve (1983) reported that sex significantly predicted flexibility and cardiovascular function.

The results reported by the variable of grade indicated the following: (1) The average scores for males are higher on running speed and agility and standing broad jump which increased at each grade level. (2) The males tended to score better on upper-limb coordination and response speed. (3) The females tended to score better on balance and upper-limb speed and dexterity. Again, these findings are supportive of those reported by Broadhead and Bruininks (1982). Milne, Seefeldt, and Reuschlein (1976) also report that the males in K-2 grade do better on tests of agility, speed, power, and endurance, and the females do better on tests of flexibility.

Results of the AAHPERD Test as influenced by grade indicated: (1) The average mean score for the males was higher on the sit-and-reach test at all grade levels; and (2) The K-1 grade children scored better on the 9-minute run. The average mean performance of all children decreased with grade level on this test item. Ross, Dotson, Gilbert and Katz (1985) reported similar findings.

Thus, the results from the Green Grove project revealed some similiarities with and differences from the established literature. Such results could be said to highlight the value of the needs assessment procedure in physical education.

Summary of Teacher Data

In order to interpret the teachers' attitudes toward needs assessment in physical education, it seemed useful to prompt the teachers to reflect on the official goals for this subject issued by the State Department of Public Instruction. This procedure, Part I of the Teacher Questionnaire, allowed the investigator to get an idea of the teachers' perceptions of their physical education priorities before the needs assessment process was conducted. The investigator did not expect the assessment experience to be powerful enough to change profoundly the teachers' attitudes toward the motor proficiency and health-related fitness aspects of physical education. But she did expect that the classroom teachers would talk more than they did about these motor domain concepts in the individual interviews.

The post-ranking of the official goals of physical education revealed some changes in rank but not in any consistent pattern. Conversations with the teachers concerning the reasons for the changes indicated that, in the absence of direct interaction with a physical education specialist or other interested or knowledgeable person, the State Department's

physical education goals seemed not to serve to focus or change the teachers' efforts to derive physical education objectives. Therefore, one might conclude that the State Department of Public Instruction goals do not offer much guidance for instruction to these classroom teachers. Further support of this contention comes from the diffused post-rankings and the vagueness of the teachers' explanations.

In Part II of the Teacher Questionnaire, the teachers (N= 13) consistently answered positively about the data gained from the motor domain; however, it is not fully clear why they answered in this direction. At this stage of their thinking, the teachers demonstrated acceptance toward looking scientifically at scores and, concurrently, demonstrated by their interactions with the investigator the feeling that they ought to be positive about them. An example of positiveness would be that the teachers indicated strong interest and support of the Bruininks-Oseretsky Test and the AAHPERD Test ideas and findings for their classroom. But this did not translate into changes in the priority rankings of the physical education goals by the teachers. Thus, there seemed to be an attitudinal distance between the needs assessment experience and expressed interest of the teachers in the actual motor-testing process and the teachers' adoption or increased awareness of the motor-specific State Department physical education goals.

During the individual teachers' interview session, the teachers explanations suggested some reasons for their positive

answers. General grouping of these reasons include (1) increased knowledge about the children, (2) increased knowledge base about motor proficiency and health-related fitness for the teacher, and (3) increased awareness about the needs assessment process. The teachers indicated that they learned more about the children's performance and expressed value toward these data regardless of the learning domain. The testing procedure and the results of the tests gave the classroom teachers another way of looking at their individual children's performances. The tests revealed key concepts for possibilities that the motor domain might contribute which the teachers had not known before. It was also pointed out by one teacher that the testing procedure gave some children an opportunity to excel and feel good about themselves when these same children may be experiencing difficulties in the classroom.

The teachers also expressed beliefs and observations of relationships to classroom learning behavior and levels of child development. This idea could increase the possibility that the teachers would be willing to use the tests again, because they understood the results of the tests and the tests were shown to be feasible.

While the teachers apparently valued the new or increased information, this alone was insufficient to change these teachers' minds about the place of self-concept and socialization goals of physical activity for young children. It is possible that classroom teachers feel that self-concept and socialization can be shaped by their teaching practices, but they have much

less confidence, knowledge, or belief that motor proficiency and health-related fitness are amenable to their teaching. Consistently supporting the idea of needs assessment in the motor domain is perhaps related to the expressed belief of classroom teachers in this rural school in a predominantly rural county, where political and educational decisions may merge, that whatever benefits of education are offered ought to be accessible to all children. Maybe they see these activities and opportunities as vital to the socialization role of the elementary school.

While in the total faculty meeting, teachers seemed reassured that the overall school results fell within the average of the norms; however, they expressed overt concern for the status of individual children from their classrooms whose scores fell below the fiftieth percentile on the various tests. The classroom data included in Appendix J and the histograms were used to guide discussions about individual results of classrooms and individual results of children. Some of the teachers talked about helping their children reach their potential in all learning domains. They acknowledged that they would need help in implementing the concepts revealed by the two tests selected.

Because of the sense of participation and involvement on the part of the teachers, it was possible that the teachers valued the experience as much as the data and this might have influenced the positive direction of their answers on the Teacher Questionnaire. The interaction of the teachers with the

investigator produced a nonthreatening atmosphere where all of them were encouraged to express their ideas openly and honestly.

At this point one cannot project the impact of the research project in the school on teachers, principal, and children. Hence, the initial perception by the teachers that the two test batteries were practical and helpful may show a degree of optimism that could go unrealized unless there is direct leadership at some level. It becomes increasingly important for someone at the school to take the leadership role at this stage of the project if the assessment idea is to continue and be successful (Melton, 1977).

One of the teachers did assume the leadership role. She wanted to assure that the results of the needs assessment could be addressed and used. So, she initiated two 2-hour continuing education workshops for the fall semester. These workshops were structured to acquaint the teachers with activities, games, and exercises for K-3 children. The assessment data had been included in the children's permanent folders and made accessible to the teachers for the children in grades 1-3 who were continuing at Green Grove. All of the teachers and teacher's aides were involved in the workshops. One gains encouragement from the fact that the ideas for the fall in-service activities were organized by the teachers themselves.

In conclusion, the reader is reminded that involvement of the teachers in the needs assessment process was solicited throughout the research project by the investigator. Using the suggestions by Melton (1977), the following procedures were

followed: (1) The principal agreed for his school to take part in the study. (2) The teachers were asked for their support and participation in the study. The teachers' involvement included arranging class time for the pretest orientation of the children (slide presentation); clerical assistance by supplying the names, birthdays, and sex of the children; helping to monitor the children during the administration of the tests; and participation in the group faculty meeting and individual interview sessions. The involvement of the teachers was important in order to establish the concept of shared-decision making and to insure the commitment of the school to the needs assessment process and the utilization of the data obtained from the assessment efforts (Melton, 1977).

The subjective feeling of cooperation and enjoyment openly shared by the investigator, her testing team, the teachers, and children led to the investigator's perception that the needs assessment was a "success". In addition, much of the data collected in the process were of sufficient quality and interest to provide a baseline for the development of some local school physical education objectives.

CHAPTER V

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

The purpose of this study was to use tests of motor proficiency and health-related fitness to assess selected motor needs of elementary school children and to establish a baseline for the development of physical education instructional objectives.

The specific parts of the study were the following:

1) The assessment of the motor proficiency and the health-related fitness status for an entire K-3 elementary school;

2) A description of the motor proficiency and the health-related fitness status for an entire K-3 elementary school;

3) An interpretation of the motor proficiency and the health-related fitness scores for the classroom teachers in order to introduce the use of selected motor assessment data for the development of physical education objectives;

4) A discussion with the classroom teachers concerning the helpfulness and practicality of specific motor proficiency and health-related fitness testing in establishing a basis for developing their instructional objectives.

Relevant research for this study was focused primarily on the areas of needs assessment and motor performance of children, ages 5 to 8, with emphasis on motor proficiency and health-related fitness. Studies relating to the Bruininks-Oseretsky Test of Motor Proficiency and the AAHPERD Health-Related Fitness were reviewed.

The study was conducted in the spring of 1984. One school from Robeson County, North Carolina, was selected for this study, the Green Grove Elementary School. The school had a student population of 323 and a teacher population of 13 and was classified as a K-3 elementary school. All of the teachers and students participated in the study.

The general method of the study was a descriptive design. Quantitative data were collected, analyzed, and interpreted about student motor behavior. Only motor performance scores were used in the student assessment phases of the study. Qualitative data were collected, analyzed, and interpreted from teacher responses about the helpfulness and practicality of the needs assessment data.

In order to assess two significant aspects of motor performance in selected K-3 children, two instruments were selected for the study. The measurement tools chosen to assess the motor proficiency and health-related fitness of elementary

school children were the Bruininks-Oseretsky Test of Motor Proficiency and the AAHPERD Health-Related Fitness Test.

Descriptive statistics were used to present and interpret the results of the school-wide overview of the motor performance data of the children. Nonparametric statistical analyses were used to strengthen the interpretation for describing the relative performance scores for the students on the two test batteries. The Mann-Whitney U-Test was used to determine whether the median scores of the males and females differed from each other to a significant degree on any particular test score or set of test scores; the Kruskal-Wallis One-Way Analysis of Variance was used to determine whether any of the student groups differed from each other to a significant degee; and the Pearson Product Moment Correlations were computed to show to what extent test scores were related.

An alpha level of .10 requiring a p = .00457 was accepted for the degree of significance for the Mann-Whitney U-Test and the Kruskal-Wallis One-Way Analysis of Variance. A high positive or negative correlation of .70 to .90 was used for the Pearson Product Moment Correlations as the basis of discussion important relationships among items.

The results of the descriptive data for the Bruininks-Oseretsky Tests found that (1) the children at Green Grove scored within the average range, (2) the males tended to score higher on the overall test, (3) significance differences

were found between the females and males on running speed and agility, bilateral coordination, upper-limb coordination, response speed and upper-limb speed and dexterity, and (4) a high positive correlation was found between running speed and agility for males and females and for 6-, 8- and 9- year olds.

The descriptive data for the AAHPERD Test reveals that the males were more flexible and had more abdominal strength and endurance and the females scored higher on the 9-minute run. On the average the students at Green Grove scored below the fiftieth percentile on sit-ups and the 9-minute run.

The results of the nonparametric data revealed that some Bruininks-Oseretsky Test scores tended to improve with age. The items which improved for the females were two aspects of visual motor control, upper-limb speed, and bilateral coordination. The males improved on running speed and agility, strength, upper-limb control and one aspect of visual motor control. Eleven out of 11 test items were shown to yield a significant difference among the age groups. The three items not significantly different were the two balance subtests and visual-motor control #5.

The results from the Teacher Questionnaire revealed that the classroom teachers understood the needs assessment process and that they agreed that the information obtained from the needs assessment could be useful and helpful to them in developing physical education objectives for their classes or for individual

students. The majority of the teachers agreed that they would administer the tests in the future, especially if they received assistance, and they recommended that the tests be given at the beginning of the school year so that the information could be used during the school year.

Conclusions

Based on the data provided by this investigation, and within the scope of the study, the following conclusions appear to be justified:

(1) Classroom teachers did view a motor proficiency and health-related fitness data base as being useful in developing physical education objectives.

(2) The needs assessment strategies developed in this study proved to be perceived as helpful and practical for future use by the classroom teachers at Green Grove School.

(3) Both the Bruininks-Oseretsky Test and the AAHPERD Test were needed to assess motor proficiency and health-related fitness of Green Grove K-3 children in order to establish baseline data for use by the teachers and curriculum planners.

Practical and Educational Implications

Beyond the conclusions and the limits of numerical findings are facts which could guide further needs assessment practices and inquiry.

(1) A research team was needed to accomplish the study within the allotted time frame. The research team was trained

and paid for their services. Students, parents, teachers, and teachers' aides could serve as reliable testers if they were trained properly.

(2) Both tests can be given during a time frame of three 30-minute periods to classes of K-3 children up to 40 students in size.

(3) The author's original slide presentation was helpful in introducing the Green Grove children to the various test items because it seemed to cut down on the explanation time.

(4) A needs assessment can best be carried out if you have the full cooperation of the total school population; this includes teachers, students, and the principal as Melton (1977) recommends. However, to be successful, the "needs assessment" must be a joint effort between the researcher and the school (Melton, 1977).

(5) The data seemed to indicate that while the overall mean fell in the average range for interpretation some children at Green Grove may be falling behind the national norms which is a firm indication of a need justifying a regular physical activity program.

Recommendations for Future Research

The possibilities for doing additional needs assessment research concerning K-3 children's motor proficiency and health-related fitness are vast. And while this study did answer several research questions about one specific K-3 school

population and specific classroom teachers, it gave rise to some other future research concerns:

(1) The needs assessment used for this study was appropriate for use with classroom teachers and served effectively to identify the motor proficiency and health-related fitness status of the K-3 children at Green Grove. This model is recommended for use by others interested in acquiring an increased understanding of the motor performance of K-3 children and how such information could serve as a basis for curriculum decision-making in physical education.

(2) The scope of this study was limited to describing the motor performance and health-related fitness status of one specific K-3 elementary school, and establishing baseline data for the use of 13 classroom teachers in developing classroom and individual student physical objectives. Further research involving other K-3 schools is recommended for the purpose of more and wider baseline data.

(3) Future research could be attempted to establish local or county motor proficiency and health-related fitness norms for K-3 children.

(4) Future research could examine the practices of classroom teachers as they conduct needs assessment studies in other areas of the physical education curriculum.

(5) Future continuing research could examine the effects of the needs assessment study on the physical education program changes at Green Grove and how subsequent changes might affect the K-3 childrens' motor performance.

BIBLIOGRAPHY

American Alliance of Health, Physical Education, Recreation, and Dance. (1980). AAHPERD health-related fitness test. Washington, D. C.

American Alliance of Health, Physical Education, Recreation, and Dance. (1981). Essentials of a quality elementary physical education program: A position statement. Washington, D.C.

American Alliance of Health, Physical Education, Recreation, and Dance. (1983). A framework for physical education K-12. Raleigh: North Carolina: State Department of Public Instruction.

Annarino, A. A., Cowell, C. G., & Hazelton, A. W. (1980). Curriculum theory and design in physical education (2nd ed.). St. Louis: C. V. Mosby.

Anttonen, J. & Garman, C. G. (1976). An annotated bibliography of practical tests for young children. (ERIC Document Reproduction Service No. ED 156 683).

Bachman, J. C. (1961). Motor learning and performance as related to age and sex in two measures of balance coordination. Research Quarterly, 32, 123-37.

Barrow, H. N., & McGee, R. (1979). A practical measurement in physical education (3rd ed.). Philadelphia: Lea & Febiger.

Baumgartner, T., & Jackson, A. (1982). Measurement in physical education. Boston: Houghton-Mifflin.

Bayley, N. (1935). The development of motor abilities during the first three years. Monographs of Social Research in Child Development, 1 (1), 1-26.

Beauchamp, G. A. (1981). Curriculum theory (4th ed.). Itasca, Il.: Peacock.

Belka, D. E., & Williams, H. G. (Eds.). (1979). Perceptual-motor, perceptual, and cognitive performances. Perceptual and Motor Skills, 49 (1), 131-41.

Bellack, A. A., & Kliebard, H. M. (Eds.). (1977). Curriculum and evaluation. Berkeley: McCutchan.

Bietel, P. A., & Mead, B. J. (1980). Bruininks-Oseretsky test of motor proficiency: A viable measure for 3-to-5- year-old children. Perceptual and Motor Skills, 51 (3), 919-23.

Bietel, P. A., & Mead, B. J. (1982). Bruininks-Oseretsky test of motor proficiency: Further verification with 3-to-5- year old children. Perceptual and Motor Skills, 54 (1), 268-70.

Blixt, S., & Kitson, D. L. (1982). Factor structure of the McCarthy screening test. Psychology in the Schools, 19 (1), 33-38.

Broadhead, G. D., & Bruininks, R. H. (1982). Childhood motor performance traits on the short form Bruininks-Oseretsky test. Physical Educator, 39 (3), 149-55.

Bruininks, R. H. (1972). Bruininks-Oseretsky test of motor proficiency. Minneapolis: American Guidance Service.

Bruininks, R. H. (1974). Physical and motor development of retarded persons. In N. R. Ellis (Ed.), International review of research in mental retardation (Vol. 7), New York: Academic Press.

Bruininks, R. H. (1978). Bruininks-Oseretsky test of motor proficiency. Circle Pines, MN: American Guidance Service.

Bruininks, R. H. , Sullivan, L., & Short, N. J. (1974). Visual-motor abilities of learning disabilities and nondisabled children. Paper presented at the 52nd Annual International Convention of the Council for Exceptional Children, New York.

Bruner, J. S. (1973). Organization of early skilled action. Child Development, 44, 1-11.

Carlson, E. R. (1972). Status of research on children with perceptual-motor dysfunction. Journal of Health, Physical Education and Recreation, 43, 57-59.

Carpenter, A. (1942). Strength testing in the first three grades. Research Quarterly, 13, 328-332.

Carpenter, A. (1942). The measurement of general motor capacity and general motor abilities in the first three grades. Research Quarterly, 13, (4), 444-65.

Charlop, M., & Atwell, C. W. (1980). The Charlop-Atwell scale of motor coordination: A quick and easy assessment of young children. Perceptual and Motor Skills, 50 (3) 1291-1308.

Cowell, C. C., & Hazelton, H. W. (1955). Curriculum designs in physical education. Englewood Cliffs, New Jersey: Prentice-Hall, Inc.

Cratty, B. J. (1967). Movement behavior and motor learning. Philadelphia: Lea & Febiger.

Cratty, B. J. (1970). Perceptual and motor development in infants and young children. New York: Macmillan.

Cratty, B. J. (1975). Perceptual and motor development in infants and children (2nd ed.). Englewood Cliffs, NJ: Prentice-Hall.

Cureton, K. J., Boileau, R. A., & Lohman, T. G. (1975). Relationship between body composition measures and AAHPERD test performance in young boys. Research Quarterly, 46, 218-29.

Espenshade, A. S. (1940). Motor performance in adolescence. Monographs of the Society for Research in Child Development, 5 (1 Serial No. 24).

Espenshade, A. S. (1960). Motor development. In W. R. Johnson (Ed.), Science and medicine of exercise and sports. New York: Harper Row.

Espenshade, A. S. (1963). Restudy of relationships between physical performance of school children and age, height, and weight. Reaearch Quarterly, 34 (2), 144-53.

Espenshade, A. S., & Eckert, H. M. (1967). Motor development. Columbus, OH: Charles E. Merrill.

Espenshade, A. S. & Eckert, H. M. (1980). Motor development (2nd ed.). Columbus, OH: Charles E. Merrill.

Fleishman, A. E. (1964). The structure and measurement of physical fitness. Englewood Cliffs, NJ: Prentice-Hall.

Fox, D. J. (1969). The research process in education. New York: Holt, Rinehart, & Winston.

Garvey, R., & Kimball, T. R. (1978, March). Development of a perceptual-motor rating scale for classroom teachers to record child behavior. Paper presented at the Annual Meeting of the American Education Research Association, Toronto, Ontario, Canada.

Glassow, R. B., Halverson, L. E., & Rarick, G. L. (1965). Improvement of motor development and physical fitness in elementary school children. Madison: University of Wisconsin. (Cooperative Research Project No. 696).

Glassow, R. B., & Krause, P. (1960). Motor performance of girls age 6 to 14 years. Research Quarterly, 31 (3), 426-33.

Goodlad, J. I., & Associates. (1979). Curriculum inquiry. New York: McGraw-Hill.

Guilford, J. P. (1958). A system of psychomotor abilities. American Journal of Psychology, 71, 164-174.

Gutteridge, M. S. (1939). A study of the achievements of young children. Archives of Psychology, 244, 1-78.

Haag, H. (1983). Data based curriculum development: Perception of aims and objectives by physical education teachers. In: A. E. Jewett, M. M. Carnes, & M. Speakman (Eds.), Proceedings of the Third Conference on Curriculum Theory in Physical Education (pp. 279-299), Athens: The University of Georgia.

Halverson, L. E., & Roberton, M. A. (1966). A study of motor pattern development in young children. Report at National Convention, AAHPER.

Halverson, L. E., & Roberton, M. A. (1984). In B. J. Logsdon et al. (Eds.), Physical education for children. Philadelphia: Lea & Febiger.

Harrow. A. J. (1972). Taxonomy of the psychomotor domain: A guide for developing behavioral objectives. New York: David McKay.

Hensley, L. D., East, W. B., & Stillwell, J. L. (1982). Body fatness and motor performance during preadolescence. Research Quarterly for Exercise and Sport, 53 (2), 133-40.

Hinkle, D. E., Wiersma, W., & Jurs, S. G. (1979). Applied statistics for the behavioral sciences. Chicago: Rand McNally.

Hughes, C. E. (1978). Field study of the SAVVY curriculum design in kindergarten physical education, Level I. Unpublished master's thesis, The University of North Carolina at Greensboro.

Hyde, B. J. B. (1975). A motor development checklist of selected categories for kindergarten. Unpublished master's thesis, The University of Kansas.

Jewett, A. E., Carnes, M. M., & Speakman, M. (Eds.). (1983). Proceedings of the Third Conference on Curriculum Theory in Physical Education. Athens: The University of Georgia.

Jewett, A. E., & Mullan, M. R. (Eds.). (1977). Curriculum design: Purpose and processes in physical education teaching-learning. Washington: AAHPER.

Jewett, A. E., & Norton, C. (Eds.). (1979). Proceedings of the First Conference on Curriculum Theory in Physical Education. Athens: The University of Georgia.

Kane, J. (Ed.). (1976). Curriculum development in physical education. London: Crosby, Lockwood, Staples.

Kaufman, A. S., & Kaufman, N. L. (1977). Research on the McCarthy scales and its implications for assessment. Journal of Learning Disabilities, 10 (5), 284-291.

Kaufman, R. (1972). Educational system planning. Englewood Cliffs, NJ: Prentice-Hall.

Kaufman, R. (1975). Needs assessment: What is it and how to do it. San Diego, CA.: United States International University.

Kaufman, R . (1983). Needs assessment. In R. S. Brandt & N. S. Olson (Eds.). Fundamental curriculum decisions. (pp. 53-67) Alexandria, VA.: ASCD.

Kaufman, R., & English, F. W. (1979). Needs assessment: Concept and application. Princeton, NJ: Educational Technology Publishers.

Kaufman, R., & Stakenas, R. G. (1981). Needs assessment and holistic planning. Educational Leadership, 38, 612-16.

Keogh, J. (1965). Motor performance of elementary school children. Los Angeles: Department of Physical Education, University of California at Los Angeles.

Kerfoot, J. F. (1969). An investigation of the perceptual-motor ability of small town and rural disadvantaged children. Madison: Wisconsin State Universities Consortium of Research Development, Stevens Point. (ERIC Document Reproduction Service No. ED 053 843).

Krause, D., & Olson, B. (1968). Motor-perceptual motor patterns: A program for establishing neurological organization. La Crosse, WI. (ERIC Document Reproduction Service No. ED 082 806).

Lee, W. S. (1973). The assessment, analysis, and monitoring of educational needs. Educational Technology, 13 (4), 28-32.

Lehman, J., & Breem, M. J. (1982). A comparative analysis of the Bender-Gestalt and Berry Buktenica test of visual-motor integration as a function of grade level for regular education students. Psychology in the Schools, 19 (1), 52-54.

Locke, L. F. (1969). Research in physical education. New York: Teachers College Press.

Malina, R. M., & Rarick, G. L. (1973). Growth, physique, and motor performance. In G. L. Rarick (Ed.). Physical activity: Human growth and development. New York: Academic Press.

McGee, R. (1984). In B. J. Logsdon, et al. (Eds.). Physical education for children. Philadelphia: Lea & Febiger.

Melograno, V. (1979). Designing curriculum and learning. Dubuque, Iowa: Kendall-Hall.

Melton, R. G. (1977). Applications of needs assessment in the public schools: Three case studies. Educational Technology, 17 (11), 36-40.

Milne, C., Seefeldt, V. & Reuschlein, P. (1976). Relationship between grade, sex, race, and motor performance in young children. Research Quarterly, 47 (4), 726-30.

Molnar, A., & Zahorik, J. A. (Eds.). (1976). Curriculum theory. Washington, D. C.: ASCD.

Morris, A. M., & Others. (1982). Age and sex differences in motor performance of 3 through 6 year old children. Research Quarterly for Exercise and Sport, 53, (3), 214-21.

Nixon, J. E., & Jewett, A. E. (1980). Introduction to physical education. (9th ed.). Philadelphia: Saunders College.

Nixon, J. E., & Locke, L. F. (1973). Research on teaching physical education. In R. M. W. Travers (Ed.). Second handbook on research on teaching. New York: Rand-McMally.

Pikler, E. (1968). Some contributions to the study of gross motor development in children. Journal of Genetic Psychology, 113, 27-39.

Pissanos, B. W., Moore, J. B., & Reeve, T. G. (1983). Age, sex, and body composition as predictors of children's performance on basic motor abilities and health-related fitness items. Perceptual and Motor Skills, 56, 71-77.

Rarick, G. L. (1961). Motor development during infancy and childhood. Madison, WI: College Printing & Typing Company.

Rarick, G. L. (Ed.). (1973) Physical activities, human growth and development. New York: Academic Press.

Rarick, G. L., Dobbins, D. A., & Broadhead G. D. (1976). Basic components in the motor performance of educable mentally retarded children: Implications for curriculum development. (Grant No. OEG 0 70 2568 610). Washington, D. C.: U. S. Office of Education.

Ridenour, M. V. (Ed.). (1978). Motor development: Issues and applications. Princeton, NJ: Princeton Book Company.

Roberton, M. A., & Halverson, L. E. (1984). Developing children: Their changing movement. Philadelphia: Lea Febiger.

Ross, J. G., Dotson, C. O., Gilbert, G. G. & Katz, S. J. (1985). Maturation and fitness test performance. Journal of Health, Physical Education, Recreation & Dance, 56 (1), 67-69.

Ross, J. G. & Gilbert, G. G. (1985). A summary of findings. Journal of Health, Physical Education, Recreation & Dance, 56 (1), 45-50.

Rubin, L. (1977) Curriculum handbook. Boston: Allyn & Bacon.

Safrit, M. J. (1981). Evaluation in physical education (2nd ed.). Englewood Cliffs, NJ: Prentice Hall.

Saylor, J. G., & Alexander, W. M. (1974). Curriculum planning for schools. New York: Holt, Rinehart & Winston.

Scriven, M., & Roth, J. (1978). Needs assessment: Concepts and practice: New directions for program evaluation. San Francisco.

Seefeldt, V. (1984). Physical fitness in preschool and elementary school-aged children. Journal of Health, Physical Education, Recreation & Dance, 55 (9), 33-37.

Singer, R. N., & Dick, W. (1974). Teaching physical education: A systems approach. Boston: Houghton-Mifflin.

Sweigert Jr., R. L. (1977). Assisting learner needs with criterion-referenced tests: A working approach. Educational Technology, 17 (11), 28-35.

Taba, H. (1962). Curriculum development: Theory and practice. New York: Harcourt.

Tanner, D., & Tanner, L. (1975). Curriculum development: Theory into practice. New York: Macmillan.

Taylor, R. L. (1979). A short form of the McCarthy scales of children's abilities: Methodological and clinical applications. Psychology in the Schools, 16 (3), 347-50.

Thomas, J. R., & Chisson, B. S. (1974). Prediction of first grade academic performance from kindergarten perceptual-motor data. Research Quarterly, 45 (2), 148-53.

Thornhill, M. (1976). Motor enrichment. Putnam, OK: Putnam City Public Schools. (ERIC Document Reproduction Service No. ED 145 628).

Thorpe, H. S., & Werner, E. E. (1974). Developmental screening of preschool children: A critical review of inventories used in health and educational programs. Pediatrics, 53 (3), 362-70.

Trimby, M. J. (1979). Needs assessment models: A comparison. Educational Technology, 19, 24-28.

Turnbull, H. R., & Turnbull, A. P. (1978). Free appropriate public education law and implementation. Denver: Love.

Tyler, R. W. (1950). Basic principles of curriculum and instruction. Chicago: The University of Chicago Press.

Tyler, R. W. (1977). Desirable content for a curriculum development syllabus today. In A. Molnar & J. A. Zahorik (Eds.), Curriculum theory. Washington, D. C.: ASCD.

Van Slooten, P. (1973). Performance of selected motor coordination tasks by young boys and girls in six socio-economic groups. Unpublished doctoral dissertation, Indiana University.

Wade, M. G., & Davies, W. E. (1981). Motor skill development in young children: Current views on assessment and programming. Norwood, NJ: Ablex Publishing Corporation. (ERIC Document Reproduction Service No. ED 207 672).

Wedell, K. (1973). Learning and perceptual-motor disabilities in children. New York: John Wiley.

Wendt, R. (Ed.). (1976). Early childhood assessment: A criterion-referenced screening device test manual. Madison WI: Cooperative Educational Service Agency 13. (ERIC Document Reproduction Service No. ED 129 869).

Whittle, H. D. (1961) Effects of elementary school physical education aspects of physical, motor, and personality development. Research Quarterly, 32, 249-60.

Wickstrom, R. L. (1977). Fundamental movement patterns. Philadelphia: Lea & Febiger.

Wickstrom, R. L. (1983). Fundamental movement patterns (2nd ed.). Philadelphia: Lea & Febiger.

Wilberg, R. B. (1972). A suggested direction for the study of motor performance by physical educators. Research Quarterly, 43, 387-90.

Willgoose, C. E. (1979). The curriculum in physical education (3rd ed.). Englewood Cliffs, NJ: Prentice-Hall.

Williams, H. G. (1983). Gross motor behavior patterns of children. In C. B. Corbin. A textbook of motor development. Dubuque, IO: W. C. Brown.

Willis, D. J., & Pishkin, V. (1974). Perceptual-motor performance on the Vane and Bender tests as related to two socio-economic classes and ages. Perceptual and Motor Skills, 38, (3) 883-90.

Witkin, B. R. (1977) Needs assessment kits, models and tools. Educational Technology, 12 (11), 5-18.

Zais, R. (1976). Curriculum principles and foundations. New York: Thomas Y Crowell.

Zingale, D. (1975). Theory into practice: An inservice approach. Journal of Physical Education and Recreation, 46, 31-35.

APPENDIX-A: APPROVAL

HUMAN SUBJECTS REVIEW COMMITTEE

The University of North Carolina
at Greensboro
School of Health, Physical
Education, Recreation & Dance
Greensboro, North Carolina 27412-5105

12/15/83
Date

To: M. McCormick :

The purpose of this communication is to indicate the results of the review made by the Human Subjects Committee of your proposed project

"Needs assessment: motor performance characteristics of Green Grove Elementary School children K-3 as a rationale for curriculum design"

The evaluators have judged your plans which guarantee the rights of human subjects to be

☑ Approved as proposed

☐ Approved conditionally pending

☐ Not approved. Please contact the School Human Subject Chair, for further information.

We appreciate your compliance with School/University regulations in this important matter. Please remember your commitment to notify the Committee in the event of any change(s) in your procedure.

Sincerely,

Chair, School of HPERD
Human Subjects Review Committee

Revised 12/83

APPENDIX-B

PARENTAL CONSENT FORM

THE UNIVERSITY OF NORTH CAROLINA AT GREENSBORO
SCHOOL OF HEALTH, PHYSICAL EDUCATION & RECREATION

SCHOOL REVIEW COMMITTEE

INFORMED CONSENT FORM*

I understand that the purpose of this study will be to use test of motor proficiency and health-related fitness to assess selected motoric needs of elementary school children as a basis for the development by the classroom teacher of specific physical education instructional objectives.

I confirm that my child' participation is entirely voluntary. No coercion of any kind has been used to obtain my child, cooperation.

I understand that I may withdraw my consent and terminate my child's participation at any time during the project.

My child have been informed of the procedures that will be used in the project and understand what will be required of him/her as a subject.

I understand that all of my child's responses, written/oral/task, will remain completely anonyous.

I understand that a summary of the results of the project will be made available to me at the completion of the study if I so request.

I wish to give my child's voluntary cooperation as a participant.

Signature

Address

Date

*Adopted from L. F. Locke and W. W. Spirduso. Proposals that work. New York: Teachers College, Columbia University, 1976, p. 237.

APPENDIX-C

SLIDE PRESENTATION

SLIDE PRESENTATION

Slides of the test items will be presented to the children at Green Grove. The format of the slides will follow as close as possible the demonstrations in the tests manuals

Bruininks-Oseretsky Test of Motor Proficiency

Subtest 1: Running Speed and Agility
Three slides: 1) Child in starting position
2) Child coming back with block in hand
3) Child crossing finish line

Subtest 2: Balance
Two slides: 1) Hands on hips
2) Leg bent 45 degree angle
2a: Balance walking
One slide: 1) Heel-to-toe walk

Subtest 3: Bilateral Coordination
3a: Tapping feet alternately while making circles with fingers
(Slide taken from manual)
3b: Jumping up and clapping hands
(Slide taken from manual)
Subtest 4: Standing broad jump
Two slides: 1) Child in starting position
2) Child in landing position

Subtest 5: Upper-Limb Coordination
5a: Catching a tossed ball with both hands
One slide: Child with ball in hand & teacher's follow-through
5b: Throwing a ball at a target with perferred hand
Two slides: 1) Target; child in starting position .
2) Arm extended toward target.

Subtest 6: Response speed
One slide: Show starting position.

Subtest 7: Visual-motor control
7a: Copying a circle with preferred hand
7b: Copying overlapping pencils with preferred hand
Two slides: Showing hand in process of performing tasks

Subtest 8: Upper-limb speed and dexterity
8a: Sorting shape cards
One slide: Child with cards in hand looking at card stacks on table

8b: Making dots in circles with preferred hand
One slide: Hand in position on paper

AAHPERD HEALTH-RELATED FITNESS TEST

Test 1: Distance Run
One slide: Children with different colored pennies on spaced at various distances

Test 2: Skinfold measures
Two slides: 1) Back position
2) Arm position

Test 3: Sit-ups
Two slides: 1) Child in starting position
2) Child in up position

Test 4: Sit & reach
One slide: 1) Child in held position

APPENDIX-D

SLIDE PICTURES

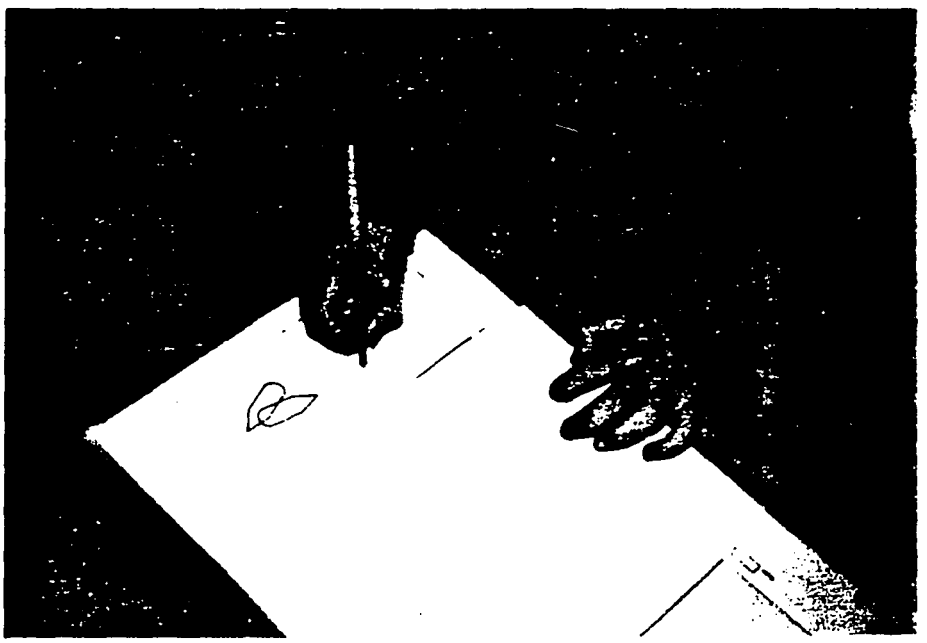
BRUININKS-OSERETSKY TEST OF MOTOR PROFICIENCY

(1) RUNNING SPEED AND AGILITY

(2) BALANCE #2: STANDING ON ONE LEG ON BALANCE BEAM

(3) BALANCE #7: WALKING HEEL-TO-TOE ON BALANCE BEAM

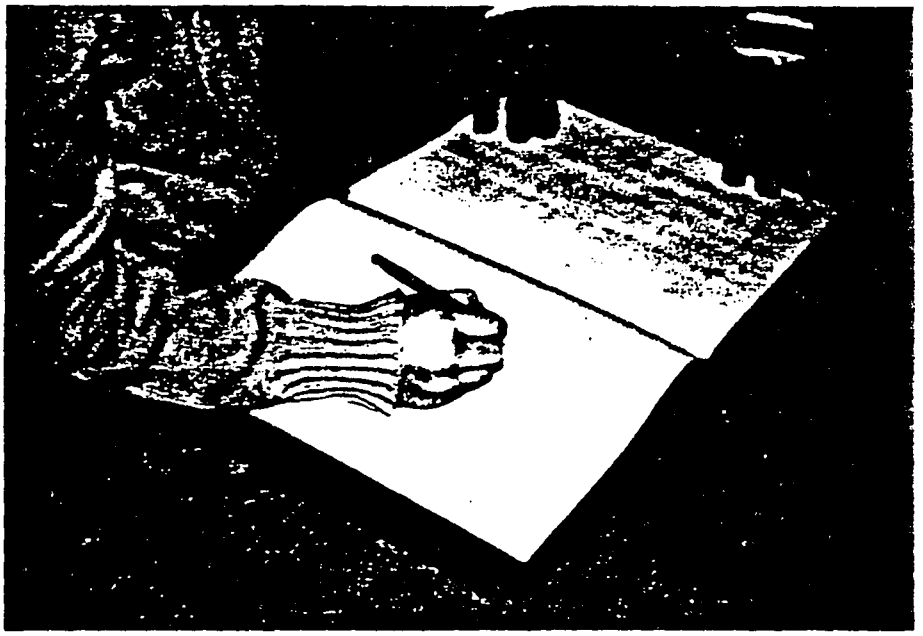
(4) VISUAL-MOTOR CONTROL #3: COPYING OVERLAPPING PENCILS



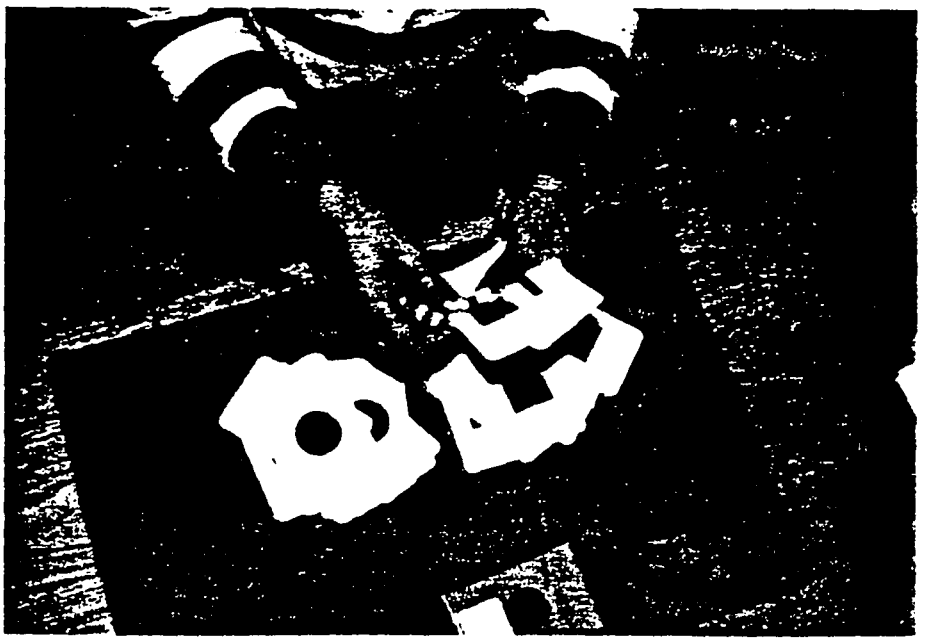
(5) VISUAL-MOTOR CONTROL #5: COPYING A CIRCLE

(6) VISUAL-MOTOR CONTROL #8: DRAWING A LINE THROUGH A STRAIGHT PATH

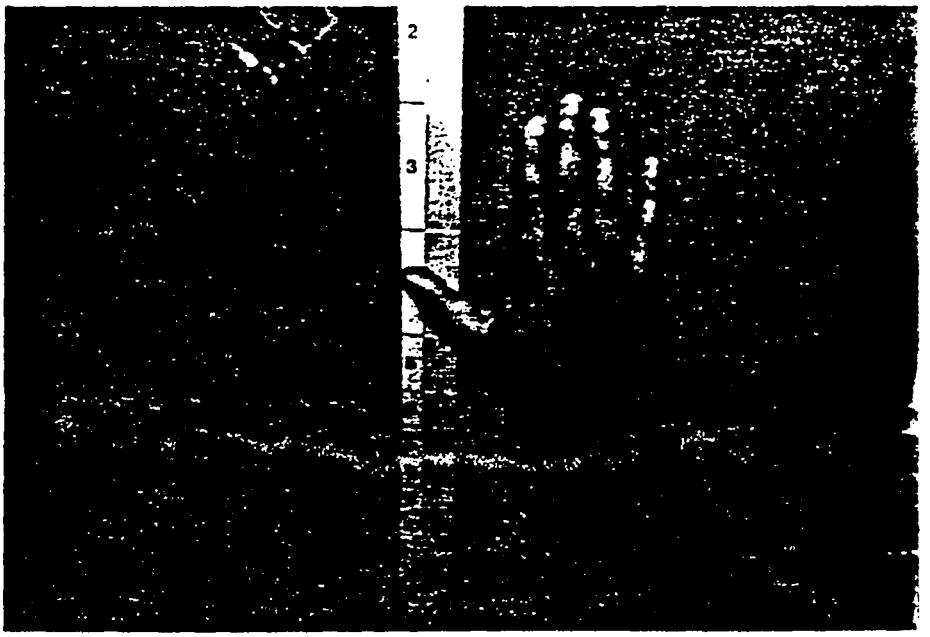
(8) UPPER-LIMB SPEED AND DEXTERITY #7: MAKING DOTS IN CIRCLES



(7) UPPER-LIMB SPEED AND DEXTERITY #3: SORTING SHAPE CARDS



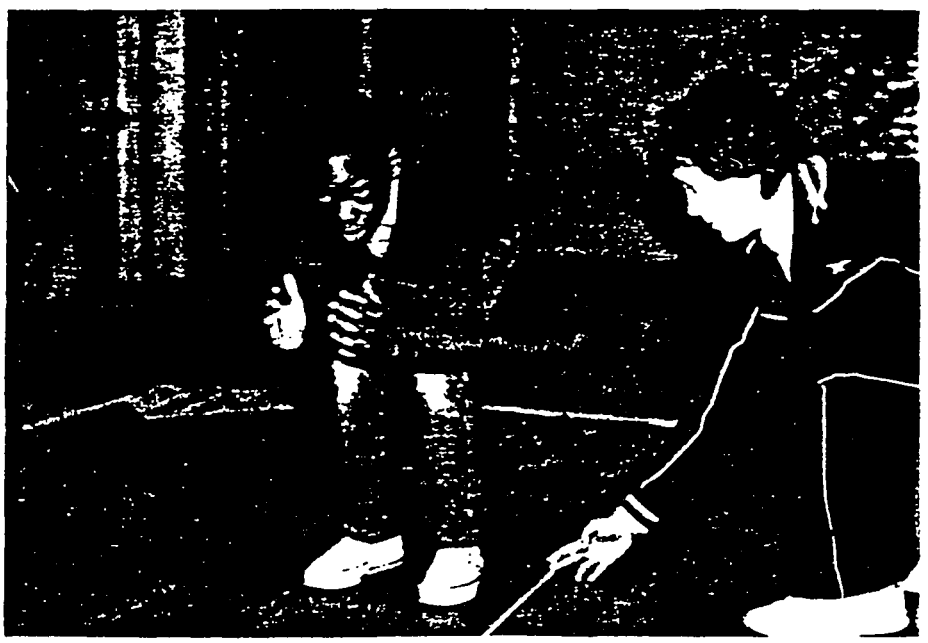
(9) RESPONSE SPEED



(10) BILATERAL COORDINATION #1: TAPPING FEET ALTERNATELY WHILE MAKING CIRCLES WITH FINGERS

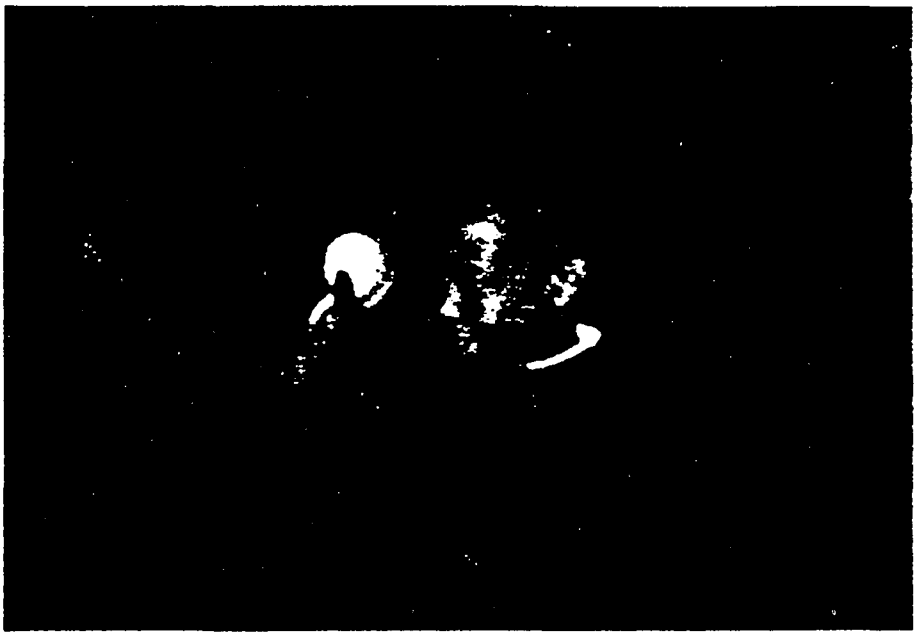
(11) BILATERAL COORDINATION #6: JUMPING UP AND CLAPPING HANDS

(12) STRENGTH: STANDING BROAD JUMP



(13) UPPER-LIMB COORDINATION #3: CATCHING A TOSSED BALL WITH BOTH HANDS

(14) UPPER-LIMB COORDINATION #5: THROWING A BALL AT A TARGET

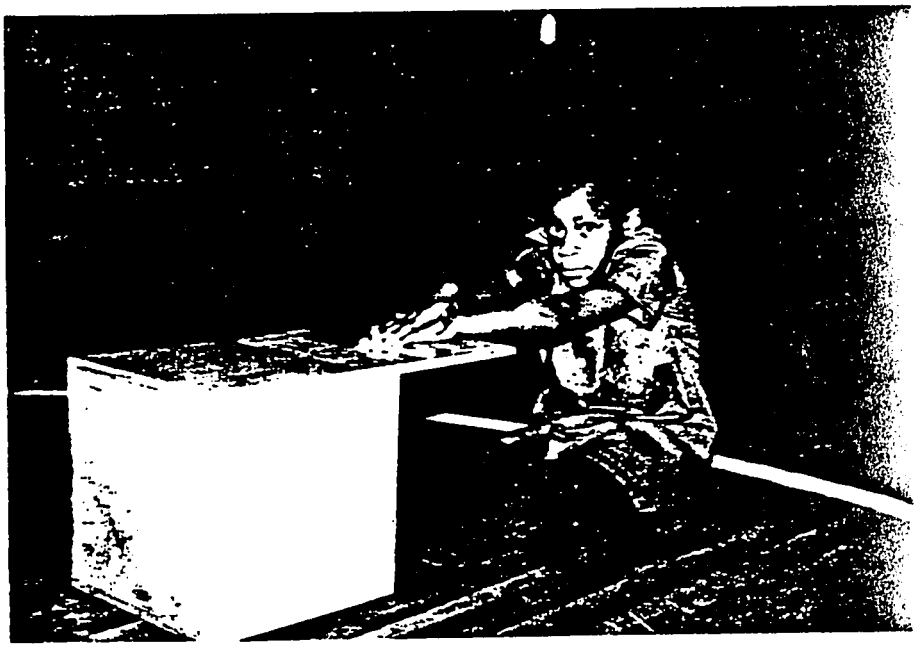


AAHPERD HEALTH-RELATED FITNESS TEST

(1) SKINFOLD TEST

(3) SIT-UPS

(2) SIT AND REACH



(4) 9-MINUTE RUN

APPENDIX-E: CORRESPONDENCE

CORRESPONDENCE WITH SCHOOL SUPERINTENDENT ROBESON COUNTY PUBLIC SCHOOLS

3539 Dixon Road
Durham, North Carolina
(919) 489-0481

October 30, 1983

Mr. Purnell Swett, Superintendent
Robeson County Schools
Lumberton, North Carolina 28358

Dear Mr. Swett:

I am an Assistant Professor of Physical Education at North Carolina Central University, and am currently on leave to complete research for the doctoral program at the University of North Carolina at Greensboro.

As I told Mr. Humphrey during our conference on Thursday, October 26, I would like to do a needs assessment study of elementary school children's motor performance. The study will involve (1) interpret the motor performance of the children with the established test norms of fitness test, perceptual motor test, and motor performance test, (2) identifying the children's motor performance strengths and weaknesses in reference to the test norms, and (3) suggesting program objectives to meet the needs of the children to increase their strengths and to eliminate their weaknesses in motor performance.

To accomplish the study, I will need the assistance of the following personnel from your staff: the Director of Instructions, the Physical Education Coordinator, and the classroom teachers. A research team will be trained to assist me in the testing procedures.

I will need to involve enough children within the school system to represent the total population of elementary school children of Robeson County so that generalizations can be inferred from the data. Each class would only be used for one testing session. Each testing session would be equivalent to a thirty minute period.

The results of the study will be published in the form of a dissertation and will be made available to you and the Robeson County Board of Education. The Board will have the authority to censor any reporting of the results of the study and or future publications of the study. Following the completion of the study, I will serve as a resource person to conduct inservice workshops on elementary school physical education programs and to work directly with responsible decision makers of the school system to initiate needed program changes if the results of the study indicate such action.

As a native of Robeson County, I would like your permission to do my study in your school system. I am looking forward to working with your school system to enhance the motor performance of the children.

Sincerely yours,

Mickie R. McCormick

Robeson County Board of Education
P. O. BOX 1328
LUMBERTON, NORTH CAROLINA
ZIP CODE 28358 - 1328

OFFICE OF SUPERINTENDENT

November 8, 1983

Ms. Micky R. McCormick
3539 Dickson Road
Durham, NC 27701

Dear Mr. McCormick:

Thank you for your recent letter dated October 30, 1983, concerning the possibility of doing a need assessment of elementary school children in the Robeson County School System. This study was being requested as a part of your dissertation.

I have had my instructional staff members review your letter and I am listing our concerns.

1. It is always a practice that before we give any approval of a study, we review the document. Also, who would assume the liability.

2. We would like to know how much time this study will take away from the classroom instruction.

3. You stated you wanted to involve enough children. What is enough?

We have been involved in similar studies and have a pretty good feel for some of the things you are talking about; however, before we can make a final decision, we need the above questions answered.

If you have any further questions, please do not hesitate to advise.

Respectfully,

Purnell Swett, Superintendent
Robeson County Schools

els

APPENDIX- F: CORRESPONDENCE

AMERICAN GUIDANCE SERVICES

3539 Dixon Road
Durham, North Carolina
March 18,1984

American Guidance Service
Publishers' Building
Circle Pines, Minnesota 55014-1796

Dear Sir:

I am a doctoral student at the University of North Carolina-Greensboro. My dissertation study will involve the Short Form of the Bruininks-Oseretsky Test of Motor proficiency to be administered to 300 K-3 students.

I have already purchased the Test Kit and the Individual Record forms from your company; however, because of the number of test administrators to be trained by the investigator and the number of subjects to be included, I request your permission to duplicate enough copies of the instructions and of the following test from the Student Booklet: Copying a circle, Making dots in circles, Drawing line through a straight path, and Copying overlapping pencils to cover the testers and subjects involved in the study.

At the conclusion of the test administration all copies of the instructions and the Student Booklet tests will be collected by the investigator. Once data are analyzed the investigator will destroy all copies.

Enclosed find a copy of the proposed form. I hope you will grant me your permission for duplication. Thank you for your consideration in this matter.

Sincerely yours,

Mickie R. McCormick

Mickie R. McCormick

AGS
AMERICAN
GUIDANCE
SERVICE, INC.

John P. Yackel, President A. P. Bergee, Chairman of the Board

Publishers' Building
Circle Pines, Minnesota 55014
Telephone: (612) 786-4343

April 25, 1984

Mickie R McCormick
3539 Dixon Road
Durham, NC 27707

Dear Ms McCormick

Generally it is not our policy to allow reproduction of portions of our publications. I have discussed your request with our director of test development and he has agreed that we can make an exception in your case. We therefore grant you permission to reproduce sufficient copy for your dissertation study, as outlined in your March 18 letter, with the understanding that all copies will be destroyed upon completion of the project.

Please indicate on the reproduced copy the following:

"Reproduced by special permission of American Guidance Service for dissertation study only."

Sincerely,

Dorothy Morstad

Dorothy Morstad
Administrative Assistant

APPENDIX-G

SCHEDULE FOR TESTING

SCHEDULE FOR TESTING

April 5th (Thursday), April 11th (Wednesday) and April 17th (Tuesday)

TEACHER	NO. OF STUDENTS	TIME
Williams(K)	29	12:40-1:15
Chavis (1st)	25	1:15-1:35
Graham (2sd)	25	1:35-2:10
McDowell (3rd)	23	2:10-2:45

April 6th (Friday), April 12th (Thursday) & April 18th (Wednesday)

Page (K)	30	12:40-1:15
L. Lowry (1st)	25	1:15-1:35
Britt (2sd & 3rd)	21	210-2:45
(available make-up time 1:40-2:10)		

April 9th (Monday), April 13th (Friday) & April 19th (Thursday)

Lawson (K)	29	12:4o-1:15
Oxendine (2sd)	26	1:15-1:35
Revels (3rd)	23	2:10-2:45
(available make-up time 1:40-2:10)		

April 10th (Tuesday), April 16th (Monday) & April 20th (Friday)

Barnes (1st)	25	12:40-1:15
A. Lowry (2sd)	26	1:45-2:20
Deese (3rd)	24	2:10-2:45
(available make-up time 1:15-1:45)		

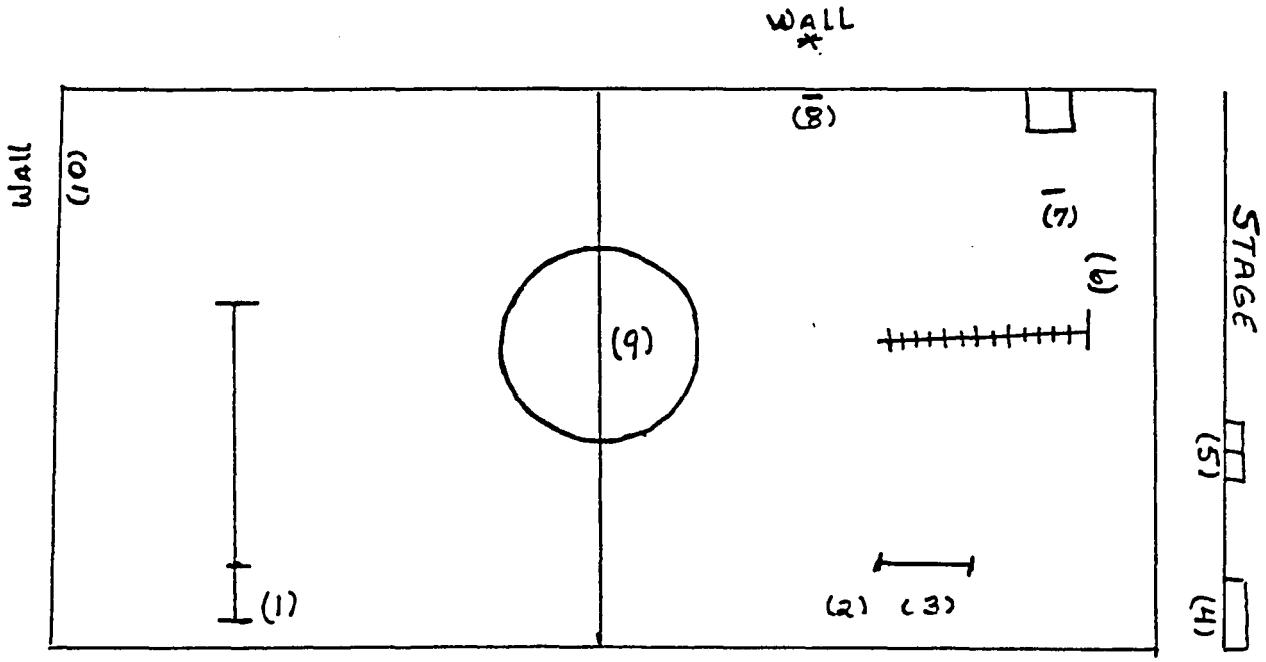
Changes in the regularly scheduled physical education classes were necessary for the following teachers because of overlapping schedules: Chavis (1st) , L. Lowry (1st) & Oxendine (2sd).

Your cooperation in this matter will be appreciated.

APPENDIX-H

FLOOR PLAN

(1) RUNNING SPEED AND AGILITY
(2) BALANCE: STANDING ON ONE LEG ON BALANCE BEAM
(3) BALANCE: WALKING HEEL-TO-TOE
(4) PENCIL AND PAPER ACTIVITIES
(5) CARD SORTING
(6) STANDING BROAD JUMP
(7) CATCHING A TOSSED BALL
(8) THROWING A BALL AT A TARGET
(9) TAPPING FEET AND MAKING CIRCLES WITH THE FINGERS & JUMPING UP AND CLAPPING HANDS
(10) RESPONSE SPEED



APPENDIX-I

RELATIONSHIP OF SHORT FORM STANDARD SCORES TO PERCENTILE RANKS AND STANINES

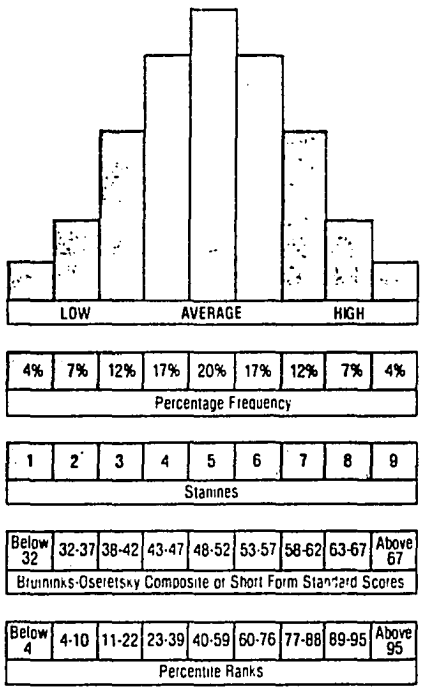


Figure 40 Relationship of composite or Short Form standard scores to percentile ranks and stanines. Bruininks (p. 137, 1978)

APPENDIX-J

INDIVIDUAL CLASS DATA

INDIVIDUAL CLASS DATA

GRADE	CLASS	N	FEMALE	MALE
KINDERGARTEN	1	29	17	12
	2	31	18	13
	3	30	11	19
FIRST	1	24	11	13
	2	26	14	12
	3	27	12	15
SECOND	1	23	11	12
	2	24	8	16
	3	24	12	12
THIRD	1	23	14	9
	2	23	9	14
	3	19	8	11
COMBINED SECOND-THIRD		20	7	13
TOTAL		323	152	171

RESULTS BY INDIVIDUAL CLASS FOR THE BRUININKS-OSERETSKY POINT SCORES

ITEM	GRADE	CLASS	M	Mdn	R	S_d	S_{ERROR}
1) RSPD							
	K	1	4.793	5.000	7.000	1.719	.319
		2	3.267	3.000	7.000	1.680	.307
		3	3.733	4.500	6.000	1.946	.355
	1st	1	6.042	7.000	6.000	1.681	.343
		2	4.769	5.000	7.000	1.657	.325
		3	4.111	5.000	7.000	1.888	.363
	2nd	1	5.957	6.000	7.000	1.581	.330
		2	5.542	6.000	9.000	2.553	.521
		3	6.750	7.000	6.000	1.726	.352
	3rd	1	6.955	7.000	7.000	1.704	.363
		2	7.217	8.000	8.000	2.022	.422
		3	7.211	7.000	5.000	1.134	.260
2nd-3rd			6.850	7.000	5.000	1.725	.386
2) BAL7							
	K	1	1.586	1.000	4.000	1.018	.189
		2	1.000	1.000	3.000	.587	.107
		3	1.867	1.000	3.000	1.252	.229
	1st	1	1.667	1.000	4.000	1.204	.246
		2	1.962	1.500	3.000	1.216	.238
		3	1.630	1.000	5.000	1.214	.234
	2nd	1	3.391	4.000	3.000	1.076	.224
		2	1.625	1.000	5.000	1.313	.268
		3	2.000	1.000	4.000	1.351	.276
	3rd	1	1.909	1.000	4.000	1.269	.271
		2	3.261	4.000	3.000	.964	.201
		3	2.316	2.000	3.000	1.293	.297
2nd-3rd			1.250	1.000	4.000	1.020	.228

3) BAL2						
K	1	2.793	2.000	5.000	1.544	.287
	2	3.500	3.000	5.000	1.737	.317
	3	4.333	5.000	5.000	1.749	.319
1st	1	4.375	4.500	5.000	1.527	.312
	2	3.769	4.000	5.000	1.904	.373
	3	4.074	4.000	5.000	2.074	.399
2nd	1	5.478	6.000	3.000	1.082	.226
	2	3.625	3.500	5.000	1.929	.394
	3	4.583	5.500	5.000	1.767	.361
3rd	1	4.364	4.000	4.000	1.560	.333
	2	5.000	6.000	4.000	1.414	.295
	3	5.316	6.000	4.000	1.416	.325
2nd-3rd		5.000	6.000	4.000	1.487	.332
4) BILAT6						
K	1	1.862	2.000	2.000	.581	.108
	2	1.200	1.000	1.000	.407	.074
	3	1.167	1.000	1.000	.379	.069
1st	1	1.875	2.000	3.000	.680	.139
	2	1.692	2.000	2.000	.679	.133
	3	1.333	1.000	3.000	.734	.141
2nd	1	2.174	2.000	2.000	.650	.136
	2	2.000	2.000	2.000	.659	.135
	3	2.375	2.000	3.000	.711	.145
3rd	1	1.955	2.000	2.000	.575	.123
	2	2.304	2.000	2.000	.559	.117
	3	2.579	2.000	3.000	.838	.193
2nd-3rd		2.150	2.000	3.000	.745	.167

5) BILAT 1						
	K	1	.724	1.000	1.000	.455	.084
		2	.900	1.000	1.000	.305	.056
		3	.833	1.000	1.000	.379	.069
	1st	1	1.000	1.000	0.000	0.000	0.000
		2	.923	1.000	1.000	.272	.053
		3	.815	1.000	1.000	.396	.076
	2nd	1	.826	1.000	1.000	.388	.081
		2	.833	1.000	1.000	.381	.078
		3	.958	1.000	1.000	.204	.042
	3rd	1	1.000	1.000	0.000	0.000	0.000
		2	.826	1.000	1.000	.388	.081
		3	.842	1.000	1.000	.375	.086
	2nd-3rd		.900	1.000	1.000	.308	.069
6) Strength							
	K	1	4.793	5.000	5.000	1.292	.240
		2	4.533	4.500	5.000	1.167	.213
		3	4.467	5.000	6.000	1.525	.278
	1st	1	6.208	6.000	6.000	1.933	.395
		2	4.923	5.500	5.000	1.412	.227
		3	5.185	5.000	4.000	1.075	.207
	2nd	1	6.565	6.000	8.000	1.830	.382
		2	6.458	6.000	7.000	1.888	.385
		3	7.250	7.500	8.000	1.984	.405
	3rd	1	7.091	7.000	5.000	1.411	.301
		2	7.739	7.000	4.000	1.421	.296
		3	7.947	8.000	5.000	1.580	.363
	2nd-3rd		7.800	8.000	7.000	1.609	.360

7) UPLIMB 5						
K	1	1.241	1.000	2.000	.511	.095
	2	1.367	1.000	2.000	.556	.102
	3	1.333	1.000	3.000	.711	.130
1st	1	1.875	2.000	2.000	.741	.151
	2	1.731	2.000	3.000	.667	.131
	3	1.481	1.000	3.000	.753	.145
2nd	1	2.391	2.000	1.000	.499	.104
	2	1.708	2.000	3.000	.751	.153
	3	1.792	2.000	2.000	.721	.147
3rd	1	1.955	2.000	3.000	.785	.167
	2	2.435	2.000	2.000	.590	.123
	3	2.000	2.000	3.000	.745	.171
2nd-3rd		1.850	2.000	2.000	.489	.109
8) UPLIMB 3						
K	1	1.414	1.000	3.000	.907	.168
	2	1.200	1.000	3.000	.961	.176
	3	1.800	2.000	3.000	.847	.155
1st	1	1.875	2.000	5.000	1.154	.236
	2	1.885	2.000	3.000	.711	.140
	3	1.926	2.000	3.000	.958	.184
2nd	1	2.261	2.000	3.000	.864	.180
	2	2.375	2.000	4.000	.824	.168
	3	2.500	3.000	3.000	.780	.159
3rd	1	2.545	3.000	2.000	.739	.157
	2	2.435	3.000	2.000	.662	.138
	3	2.632	3.000	1.000	.496	.114
2nd-3rd		2.350	2.000	2.000	.587	.131

9) RESPEED						
K	1	3.759	4.000	8.000	1.902	.353
	2	3.900	4.000	10.000	2.551	.466
	3	5.100	4.000	8.000	2.280	.416
1st	1	7.000	6.000	16.000	4.107	.838
	2	7.000	5.500	16.000	4.176	.819
	3	5.185	5.000	6.000	1.570	.302
2nd	1	7.652	6.000	9.000	3.157	.658
	2	8.667	8.000	16.000	4.290	.876
	3	5.875	6.000	11.000	2.724	.556
3rd	1	6.455	6.000	9.000	2.824	.602
	2	8.045	8.000	16.000	4.018	.857
	3	10.526	11.000	14.000	4.647	1.066
2nd-3rd		5.750	6.000	8.000	2.149	.481
10) VISMOT 8						
K	1	.379	0.000	1.000	.494	.092
	2	.533	1.000	1.000	.507	.093
	3	.400	0.000	1.000	.498	.091
1st	1	.833	1.000	1.000	.381	.078
	2	.538	.500	2.000	.582	.114
	3	.889	1.000	2.000	.506	.097
2nd	1	1.000	1.000	2.000	.426	.089
	2	.917	1.000	1.000	.282	.058
	3	.958	1.000	2.000	.359	.073
3rd	1	1.045	1.000	2.000	.575	.123
	2	1.130	1.000	2.000	.548	.114
	3	1.158	1.000	1.000	.375	.086
2nd-3rd		.950	1.000	2.000	.394	.088

11) VISMOT 5						
K	1	1.000	1.000	0.000	0.000	0.000
	2	.900	1.000	2.000	.481	.088
	3	.867	1.000	1.000	.346	.063
1st	1	.875	1.000	1.000	.338	.069
	2	.962	1.000	1.000	.196	.038
	3	1.111	1.000	2.000	.424	.082
2nd	1	1.000	1.000	2.000	.302	.063
	2	1.000	1.000	0.000	0.000	0.000
	3	1.083	1.000	1.000	.282	.058
3rd	1	1.045	1.000	1.000	.213	.045
	2	1.043	1.000	2.000	.562	.117
	3	1.263	1.000	2.000	.562	.129
2nd-3rd		.950	1.000	1.000	.224	.050
12) VISMOT 3						
K	1	2.552	2.000	2.000	.736	.137
	2	2.100	2.000	3.000	.712	.130
	3	2.000	2.000	4.000	.743	.136
1st	1	2.667	2.500	4.000	1.007	.206
	2	2.500	2.500	4.000	1.334	.262
	3	3.148	3.000	4.000	.949	.183
2nd	1	3.348	4.000	2.000	.885	.184
	2	2.917	3.000	1.943	.974	.199
	3	2.417	2.000	4.000	1.100	.225
3rd	1	3.227	3.000	2.000	.813	.173
	2	3.043	4.000	4.000	1.364	.285
	3	2.842	3.000	2.000	.898	.206
2nd-3rd		3.450	4.000	2.000	.686	.153

13) UPLMSP 7						
K	1	2.897	3.000	4.000	1.291	.210
	2	3.000	3.000	4.000	1.114	.203
	3	2.900	3.000	4.000	.885	.162
1st	1	3.583	3.000	6.000	1.501	.306
	2	3.615	4.000	5.000	1.388	.272
	3	4.037	4.000	6.000	1.285	.247
2nd	1	4.478	5.000	5.000	1.344	.280
	2	3.750	4.000	5.000	1.391	.284
	3	4.542	4.500	3.000	.721	.147
3rd	1	5.636	6.000	4.000	1.293	.276
	2	5.435	5.000	5.000	1.237	.258
	3	4.789	5.000	6.000	1.357	.311
2nd-3rd		5.000	5.000	5.000	1.124	.251
14) UPLMP 3						
K	1	2.793	2.000	7.000	1.373	.255
	2	2.833	3.000	4.000	1.147	.209
	3	2.833	3.000	3.000	.913	.167
1st	1	3.833	3.500	5.000	1.129	.231
	2	3.154	3.000	3.000	.967	.190
	3	3.370	5.000	5.000	.967	.186
2nd	1	3.565	3.000	5.000	1.441	.300
	2	4.583	5.000	6.000	1.176	.240
	3	4.125	4.000	3.000	.947	.193
3rd	1	5.136	5.000	4.000	1.207	.257
	2	4.609	5.000	6.000	1.406	.293
	3	4.737	5.000	4.000	1.284	.295
2nd-3rd		4.500	4.500	3.000	.946	.212

15) PTSCORE						
K	1	32.655	33.000	25.000	5.869	1.090
	2	30.200	31.000	25.000	5.378	.982
	3	33.667	34.000	25.000	6.110	1.116
1st	1	42.750	43.000	36.000	9.312	1.901
	2	39.385	40.500	30.000	8.367	1.641
	3	38.296	39.000	27.000	6.305	1.213
2nd	1	50.087	51.000	35.000	7.827	1.632
	2	46.458	48.500	46.000	10.950	2.235
	3	47.250	48.000	26.000	8.195	1.673
3rd	1	49.727	49.000	31.000	7.304	1.557
	2	54.136	57.000	29.000	8.892	1.896
	3	56.105	57.000	37.000	9.994	2.293
2nd-3rd		48.700	47.000	21.000	6.148	1.375
16) STDSCORE						
K	1	45.207	45.000	38.000	8.095	1.503
	2	43.000	42.500	37.000	9.599	1.753
	3	46.933	47.500	45.000	9.425	1.721
1st	1	46.750	47.500	47.000	13.747	2.806
	2	43.615	44.500	41.000	10.396	2.039
	3	41.148	39.000	44.000	9.710	1.869
2nd	1	48.261	49.000	47.000	11.565	2.411
	2	45.375	45.500	48.000	12.129	2.476
	3	45.500	48.000	38.000	10.583	2.160
3rd	1	40.045	38.500	37.000	10.750	2.292
	2	46.545	49.500	38.000	12.078	2.575
	3	48.263	50.000	51.000	15.947	3.659
2nd-3rd		41.450	41.000	33.000	10.102	2.259

17) PCTRANK						
K	1	35.448	31.000	91.000	23.064	4.283
	2	31.100	22.500	85.000	25.412	4.639
	3	41.567	40.000	96.000	26.302	4.802
1st	1	44.417	40.000	97.000	34.250	6.991
	2	33.154	29.000	92.000	27.975	5.486
	3	24.593	14.000	95.000	25.646	4.936
2nd	1	45.696	46.000	98.000	31.018	6.468
	2	38.542	32.500	98.000	30.394	6.204
	3	39.292	42.000	87.000	29.935	6.111
3rd	1	24.636	13.000	85.000	28.108	5.993
	2	44.182	48.000	89.000	32.050	6.833
	3	47.105	50.000	98.000	37.028	8.495
2nd-3rd		28.200	18.500	75.000	26.903	6.016
18) STANINE						
K	1	4.034	4.000	7.000	1.569	.291
	2	3.733	4.000	6.000	1.721	.314
	3	4.500	4.500	8.000	1.871	.342
1st	1	4.417	4.500	8.000	2.586	.528
	2	3.846	4.000	7.000	1.974	.387
	3	3.333	3.000	8.000	1.922	.370
2nd	1	4.652	5.000	8.000	2.166	.452
	2	4.250	4.000	8.000	2.192	.447
	3	4.125	4.500	6.000	2.007	.410
3rd	1	3.091	2.500	6.000	1.925	.410
	2	4.364	5.000	7.000	2.258	.481
	3	4.737	5.000	8.000	2.825	.648
2nd-3rd		3.300	3.000	5.000	1.949	.436

21)	SITRERAW						
	K	1	26.897	28.000	12.000	2.883	.535
		2	26.484	27.000	18.000	4.381	.787
		3	27.034	27.000	11.000	2.934	.545
	1st	1	26.238	27.000	18.000	4.134	.902
		2	28.240	28.000	10.000	2.773	.555
		3	26.037	26.000	17.000	4.229	.814
	2nd	1	28.955	29.000	14.000	3.415	.728
		2	24.958	24.500	19.000	4.592	.937
		3	27.174	28.000	19.000	5.237	1.092
	3rd	1	25.913	26.000	18.000	4.274	.891
		2	28.476	28.000	13.000	3.642	.795
		3	25.944	26.500	12.000	3.115	.734
	2nd-3rd		26.105	27.000	12.000	3.695	.848
22)	SITREPCT						
	K	1	55.517	55.000	75.000	20.457	3.799
		2	52.903	60.000	85.000	26.229	4.711
		3	56.793	60.000	70.000	21.877	4.062
	1st	1	54.048	55.000	85.000	26.345	5.749
		2	63.400	65.000	65.000	19.242	3.848
		3	48.519	45.000	85.000	26.158	5.034
	2nd	1	65.227	65.000	75.000	21.739	4.635
		2	45.415	42.500	90.000	26.248	5.358
		3	53.478	60.000	90.000	28.382	5.918
	3rd	1	47.391	45.000	85.000	23.735	4.949
		2	64.000	65.000	64.000	20.567	4.488
		3	53.056	60.000	60.000	18.080	4.261
	2nd-3rd		51.316	60.000	70.000	22.659	5.198

RESULTS BY INDIVIDUAL CLASS FOR THE AAHPERD TEST

ITEM	CLASS	M	Mdn	R	S_d	S_{ERROR}
19) SKINRAW*						
K	1	21.000	17.000	41.000	10.586	1.966
	2	20.065	19.000	21.000	4.788	.860
	3	19.310	19.000	16.000	3.828	.711
1st	1	18.333	17.000	24.000	4.872	1.063
	2	20.760	20.000	15.000	4.226	.845
	3	23.481	21.000	46.000	9.163	1.763
2nd	1	22.136	19.500	51.000	11.141	2.375
	2	20.042	17.000	36.000	8.405	1.716
	3	22.957	17.000	35.000	11.166	2.328
3rd	1	19.565	18.000	27.000	7.409	1.545
	2	23.810	21.000	51.000	12.548	2.738
	3	16.167	16.000	13.000	3.634	.857
2nd-3rd		19.842	19.000	18.000	5.439	1.248
20) SKINPCT*						
K	1	21.724	20.000	55.000	16.490	3.062
	2	15.484	15.000	30.000	8.302	1.491
	3	15.345	10.000	40.000	9.904	1.839
1st	1	27.857	30.000	60.000	13.926	3.039
	2	20.000	20.000	55.000	13.844	2.769
	3	15.000	10.000	55.000	12.169	2.342
2nd	1	27.500	20.000	65.000	18.819	4.012
	2	31.250	35.000	60.000	18.312	3.738
	3	30.217	30.000	70.000	22.787	4.752
3rd	1	43.261	35.000	85.000	28.309	5.903
	2	28.810	25.000	75.000	20.911	4.563
	3	50.000	45.000	50.000	15.996	3.770
2nd-3rd		29.474	25.000	60.000	15.536	3.564

* Results obtained over their clothes.

23) SITUPRAW						
	K	1	18.500	18.000	30.000	7.881	1.489
		2	15.806	16.000	25.000	5.425	.974
		3	15.483	14.000	24.000	6.817	1.266
	1st	1	26.143	24.000	17.000	4.871	1.063
		2	20.960	22.000	35.000	7.453	1.491
		3	21.407	22.000	37.000	8.464	1.629
	2nd	1	26.727	27.500	43.000	10.669	2.275
		2	24.292	22.500	35.000	10.157	2.073
		3	24.273	23.500	28.000	7.311	1.559
	3rd	1	29.739	29.000	34.000	9.056	1.888
		2	24.450	24.000	26.000	6.677	1.493
		3	27.833	25.500	26.000	7.587	1.788
	2nd-3rd		21.895	21.000	26.000	7.393	1.696
24) SITUPPCT							
	K	1	36.786	30.000	90.000	26.184	4.948
		2	29.032	30.000	70.000	16.249	2.918
		3	30.690	20.000	75.000	23.857	4.430
	1st	1	41.619	45.000	60.000	20.507	4.475
		2	32.000	25.000	80.000	22.454	4.491
		3	31.481	25.000	75.000	23.114	4.448
	2nd	1	42.045	37.500	90.000	29.747	6.342
		2	32.917	17.500	90.000	29.815	6.086
		3	30.136	20.000	65.000	19.735	4.207
	3rd	1	43.261	35.000	90.000	26.697	5.567
		2	26.750	25.000	70.000	20.149	4.505
		3	36.667	20.000	75.000	25.495	6.009
	2nd-3rd		23.158	15.000	65.000	19.735	4.528

25) RUNRAW						
K	1	1360.207	1372.000	876.000	161.038	29.904
	2	1260.778	1234.000	716.000	150.311	28.927
	3	1325.214	1310.000	654.000	125.592	23.735
1st	1	1341.826	1323.000	697.000	167.994	35.029
	2	1296.040	1268.000	663.000	186.256	37.251
	3	1336.269	1362.000	608.000	153.343	30.073
2nd	1	1450.591	1469.500	529.000	156.039	33.268
	2	1444.833	1382.000	754.000	203.473	41.534
	3	1468.000	1465.000	1288.000	330.922	72.213
3rd	1	1391.421	1280.000	897.000	253.434	58.142
	2	1361.190	1426.000	636.000	192.579	42.024
	3	1318.947	1237.000	744.000	224.382	51.477
2nd-3rd		1308.778	1281.000	743.000	199.703	47.071
26) RUNPCT						
K	1	57.414	60.000	75.000	17.506	3.251
	2	49.630	55.000	85.000	20.330	3.913
	3	53.929	60.000	75.000	17.393	3.287
1st	1	38.696	40.000	75.000	19.726	4.113
	2	35.600	35.000	75.000	21.081	4.216
	3	40.577	42.500	70.000	20.215	3.965
2nd	1	42.500	35.000	65.000	19.685	4.197
	2	38.750	37.500	70.000	20.068	4.096
	3	48.095	55.000	80.000	25.272	5.515
3rd	1	36.316	30.000	75.000	21.203	4.864
	2	29.286	30.000	60.000	17.978	3.923
	3	23.947	20.000	60.000	18.225	4.181
2nd-3rd		25.000	20.000	60.000	16.891	3.981

APPENDIX-K

TEACHER QUESTIONNAIRE

TEACHER QUESTIONNAIRE
FOR A PHYSICAL EDUCATION STUDY
SPRING 1984

Part I

Directions: Five physical education goals have been proposed for elementary school programs.* Please indicate the order of importance the program goals have for your class. One equals the most important and five equals the least important goal for your class. These goals are not ranked in order of importance.

GOALS:

_____ 1. To develop a positive self-image which includes self awareness and understanding.

_____ 2. To develop efficient and effective motor skills that will enable each pupil to handle his body skillfully and safely in all daily activities.

_____ 3. To develop interest and proficiency in using skills for successful participation in worthwhile recreational activities.

_____ 4. To develop and maintain the best possible level of performance, understanding, and appreciation for physical fitness to meet the demands of wholesome living.

_____ 5. To develop desirable social behavior as the basis for group living in a democracy.

Please list any other goals you have for your class.

*A Framework for physical education K-12. North Carolina: State Department of Education.

Part II

Directions: Please circle the answer which expresses your feelings concerning the two tests.

1. The information obtained from the Bruininks-Oseretsky Test of Motor Proficiency has been helpful to me in recognizing some of the specific motor needs of the children in my class.

   Strongly agree Agree Disagree Strongly disagree Undecided

2. The information obtained from the AAHPERD Health-Related Test has been helpful to me in recognizing some of the specific motor needs of the children in my class.

   Strongly agree Agree Disagree Strongly disagree Undecided

3. The results of the Bruininks-Oseretsky Test of Motor Proficiency could be useful to me in selecting class physical education objectives.

   Strongly agree Agree Disagree Strongly disagree Undecided

4. The results of the Bruininks-Oseretsky Test of Motor Proficiency could be useful to me in selecting individual student physical education objectives.

   Strongly agree Agree Disagree Strongly disagree Undecided

5. The results of the AAHPERD Health-Related Fitness Test could be useful to me in selecting class physical education objectives.

   Strongly agree Agree Disagree Strongly disagree Undecided

6. The results of the AAHPERD Health-Related Fitness Test could be useful to me in selecting individual student physical objectives.

   Strongly agree Agree Disagree Strongly disagree Undecided

7. I will administer the Bruininks-Oseretsky Test of Motor Proficiency in the future.

   Strongly agree Agree Disagree Strongly disagree Undecided

8. I will administer the AAHPERD Health-Related Fitness Test in the future.

   Strongly agree Agree Disagree Strongly disagree Undecided